

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA1-6 | Euston to Ickenham

Ecological baseline data: mammals (EC-003-001)

Ecology

November 2013

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Department
for Transport

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Volume 5: baseline report - EC-003-001

Ecological baseline data (CFA 1-6)

Mammals

1 Introduction

1.1.1 This document is an appendix which forms part of Volume 5 of the environmental statement (ES) for the Proposed Scheme. It details ecological baseline data collected for the following ecological aspects and species:

- bats;
- otters;
- water voles, and
- hazel dormouse.

1.1.2 The ecological baseline data detailed within this document relates to community forum areas (CFA):

- CFA1: Euston - Station and Approach;
- CFA2: Camden Town and HS1 Link;
- CFA3: Primrose Hill to Kilburn;
- CFA4: Kilburn (Brent) to Old Oak Common;
- CFA5: Northolt Corridor; and
- CFA6: South Ruislip to Ickenham

1.1.3 The document should be read in conjunction with Volume 2 (community forum area reports), Volume 3 (route wide effects assessment) and Volume 4 (off-route effects assessment).

2 Bats

2.1 Introduction

- 2.1.1 This section of the appendix presents details of baseline information relating to bats relevant to the section of the Proposed Scheme that will pass through CFA 1 to 6 inclusive.

2.2 Methodology

- 2.2.1 Details of the standard methodology utilised for bat surveys are provided in the Scope and Methodology Report Addendum (Volume 5: Appendix CT-001-000/2).
- 2.2.2 Records of bats were requested from and returned by Greenspace Information for Greater London (GiGL)¹ and London Bat Group.

2.3 Deviations, constraints and limitations

- 2.3.1 Given the limitations below, the baseline has been followed whereby key desk study data, aerial photography and surveyor local knowledge has been drawn on to augment the survey findings. Where field survey is considered insufficient, a precautionary approach has been followed to ensure baseline conditions for bats are not under-estimated.

Trees

- 2.3.2 It was not possible to gain access to the Network Rail estate within CFA 1 Euston Station and Approach, CFA2 Camden Town, CFA3 Primrose Hill to Kilburn (except for the Up-Empty Carriage Tunnel), and CFA4 Kilburn to Old Oak Common.
- 2.3.3 Due to access restrictions and safety concerns it was not permitted to carry out tree climbing inspections on high or medium potential trees on Public Right of Way (PRoW). However, these trees were subject to emergence and or dawn surveys where access restrictions and safety concerns allowed.
- 2.3.4 In CFA1, none of the trees at St James's Gardens and none of the bat boxes in trees in council flat gardens off Stanhope Street were subject to detailed inspections or emergence surveys as no access permission was available. During walkover surveys in the northeast corner of Regent's Park, a small number of mature trees were noted as having bat potential. No further surveys of these trees were undertaken due to Scheme design changes which meant the trees were not within the land required for the Proposed Scheme. Later Scheme design changes meant they were once again within the land required however this was near to the end of the survey period when time did not allow for further surveys.
- 2.3.5 In CFA3 detailed climbing inspections of the identified trees were not carried out due to access restrictions. One of the trees identified with moderate potential was situated on a busy roundabout the B509 (Belsize Road/Hilgrove Road) and emergence surveys could not be carried out due to access and safety constraints.

¹ Greenspace Information for Greater London. Available from: <http://www.gigl.org.uk/>. Last accessed: August 2013.

- 2.3.6 In CFA6 during walkover surveys at Ruislip Golf Course, Brackenbury Farm and the pharmaceutical research facility west of Breakspear Road South, it was noted that there were a number of mature trees that may have bat potential. No further surveys of these trees were possible due to access restrictions. No initial tree assessments or further tree surveys were carried out in the fields south of Bayhurst Wood as this was a late addition to the area required for the construction of the Proposed Scheme.
- 2.3.7 In CFA6 back tracking surveys were undertaken at two sites with a large number of suitable trees. These were Copthall Covert and the bridleway south west of Gatemead Farm, which had approximately 60 and 25 trees respectively with moderate or high bat potential that required further survey. A number of trees within Copthall Covert were considered unsafe to climb as the trees were very close and there were few safe anchor points. No tree climbing was carried out along the bridleway due to lack of access. Back tracking surveys were carried out at these two sites instead of conducting emergence surveys on all the individual trees, which allowed multiple trees to be surveyed more efficiently.
- 2.3.8 In CFA6 for a small number of trees, identification of a roost near the end of the survey period meant that only two of the recommended three emergence surveys could be carried out in the time available. This included a tree at Oak Farm, and, following the back tracking surveys, three confirmed bat roosts in trees in the bridleway southwest of Gatemead Farm.

Buildings and structures

- 2.3.9 It was not possible to gain access to the Network Rail estate within CFA 1 Euston Station and Approach, CFA2 Camden Town, CFA3 Primrose Hill to Kilburn (except for the Up-Empty Carriage Tunnel), and CFA4 Kilburn to Old Oak Common.
- 2.3.10 Since access permission was not granted for the majority of buildings and other structures on private land, an initial assessment of potential to support roosting bats was carried out from PRow. This was a methodological deviation which assumed initial assessment would be carried out with access permission to that building or structure. Assessing the roost potential from PRow meant that in most cases, only partial views were available to inform the assessment. Assessments of bat potential in such circumstances therefore drew upon professional judgement based on the age, and materials of the structure, and use of aerial imagery. Given the limits on assessment a precautionary approach has been adopted based on a realistic worst case scenario.
- 2.3.11 The majority of the route in C251 is a built environment and priority was given to those buildings and structures on the demolitions schedule. For some structures not on the demolition schedule surveyors had raised but had not been able to confirm possible moderate bat roost potential during initial walkovers. Access constraints in Camden and to Network Rail Land together with the curtailment of the survey period prevented follow up surveys on such buildings and structures once it became known that even though not subject to demolition, they might require extension, strengthening and repair.

- 2.3.12 In CFA1 it was not possible to inspect or survey a small number of pubs, residential and office buildings.
- 2.3.13 In CFA1 the National Temperance Hospital was subject to detailed inspection involving an external survey and internal survey where access allowed. There was no access to the derelict parts of the building due to safety concerns but the roof in this area could be viewed adequately from the newer sections of the building.
- 2.3.14 In CFA1 no access was available for the Network Rail substation so no detailed surveys other than initial inspection could be undertaken.
- 2.3.15 In CFA2 it was not possible to inspect or survey a number of warehouses, commercial buildings or outbuildings. Other structures that couldn't be surveyed included Camden Road Station, railway arches at Camden Gardens, railway arches between Haven Street and Torbay Street, railway arches to the south of Chalk Farm Road, the former Primrose Hill Station, a tunnel at the former Primrose Hill Station and the Regent's Park Road pedestrian bridge.
- 2.3.16 In CFA3, only one of the two recommended hibernation roost visits to the Up-Empty Carriage Tunnel were undertaken due to access constraints and health and safety reasons. During this one hibernation roost visit, the surveyor was not permitted to walk more than ten metres inside each end of the tunnel as it was deemed a confined space and the necessary safety equipment was not available at the time of survey. The tunnel however was inspected again as far as possible from the ground outside of the hibernation season. Given the limitations, the extent of this tunnel's use by bats as a hibernation roost site follows a precautionary approach.
- 2.3.17 In CFA3 access to the Western Horse Tunnel was only gained in August 2013 and therefore no hibernation roost inspections were undertaken. Only part of this tunnel could be inspected in August as the majority of the tunnel is flooded. No works are proposed to the Western Horse Tunnel in the Proposed Scheme, however it's condition and use by bats is relevant to the Up Empty Carriage Tunnel as the two are linked. In CFA3 only one of three summer emergence surveys of the Up-Empty Carriage Tunnel and the Western Horse Tunnel were undertaken. In addition only one of three autumn swarming surveys was undertaken at the Up Empty Carriage Tunnel and Western Horse Tunnel due to the timescale restrictions for the delivery of the ES.
- 2.3.18 In CFA4 it was not possible to inspect or survey approximately 43 buildings or other structures. These mainly consisted of the buildings associated with the rail depot sites around Old Oak Common (rail depots, substations and assorted outbuildings), along with a number of warehouses near Atlas Road and a number of rail bridges.
- 2.3.19 In CFA4 it was not possible to carry out autumn swarming surveys of the tombs/mausoleums in Kensal Green Cemetery due to project time constraints and due to the Cemetery's opening hours.
- 2.3.20 The Transport for London (TFL) land which lies adjacent to the Proposed Scheme from North Acton Station in CFA4 to West Ruislip Station in CFA6, was not accessed until May 2013 due to access constraints. Structures with potential to support hibernating and summer roosting bats were identified in CFA4 and CFA5, however

inspections were not possible due to further access constraints. Emergence or dawn surveys were not possible as surveys were only permitted between 8am and 4pm.

Activity surveys

- 2.3.21 In each CFA the features identified from desk study as being of most importance for foraging and commuting bats were sampled as part of a series of activity transect surveys, some from PRoW. The exception to this was in CFA6 where an area of woodland habitat which forms part of Newyears Green Covert, and the hedgerows around the fields to the south of Bayhurst Wood, both within the land required for the Proposed Scheme and which were considered to be of potential importance for bats, could not be surveyed due to access constraints.
- 2.3.22 Due to technical difficulties with the static detectors only two nights of data (rather than the intended seven) were collected in July at four locations, including the towpath of the Grand Union Canal at Old Oak Common in CFA4; River Pinn at Oak Farm in CFA6; Gatemead Farm in CFA6; and Copthall Farm in CFA6. However, the full seven nights of data were collected from the static detectors at these locations in June and August which will reduce the significance of this limitation.
- 2.3.23 In CFA6, the dawn transect survey on the 14th August 2013 along the PRoW around the Newyears Green area was cancelled due to sub-optimal temperatures. This survey could not be rescheduled so close to the end of the HS2 survey period.

2.4 Baseline

Overview of bat species status from CFA1-CFA6

- 2.4.1 In general, the diversity of bat species and the level of bat activity recorded during the surveys increased from the east of the Proposed Scheme in CFAs1-5 (which is highly urbanised) to the west in CFA6 (which includes habitats more suitable for roosting, commuting and foraging (including woodland, hedgerows, mature trees, farms, farmland, and waterbodies).

CFA1

- 2.4.2 The species recorded from field surveys in this CFA were common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), noctule (*Nyctalus noctula*) and brown long-eared (*Plecotus auritus*).

Roosting (trees)

- 2.4.3 The initial assessment of trees included St James's Garden, Euston Square Gardens and trees on PRoW. Of the trees surveyed:
- no confirmed roosts were recorded;
 - nine trees in St James's Garden contained features with a high potential to support roosting bats; and
 - 15 trees in St James's Garden contained features with a moderate potential to support roosting bats and a set of seven bat boxes with a moderate potential to support roosting bats were recorded on mature trees in council flat gardens

off Stanhope Street.

- 2.4.4 During a walkover survey in the north-east corner of Regent's Park, a small number of mature trees which may have bat potential were noted. These were not subject to further surveys due to reasons outlined in the limitations section. No trees were subject to detailed inspection or emergence surveys due to lack of access agreement.
- 2.4.5 The desk study did not report any records which are relevant to the baseline for the Proposed Scheme.
- 2.4.6 It is likely that any tree roosts within the land required for the Proposed Scheme in this CFA would be limited to the small number of trees in the north-east corner of Regent's Park, St James's Garden and the council flat gardens off Stanhope Street. It is likely that if present they would comprise small roosts of common species, however the presence of a maternity roost cannot be ruled out, particularly for St James's Garden where trees with high potential for roosts were recorded.

Roosting (buildings and structures)

- 2.4.7 A total of 67 buildings or other structures were subject to initial assessment. Of these buildings and structures:
- no confirmed roosts were recorded;
 - one building, a Network Rail substation near Mornington Terrace contained features with a high potential to support roosting bats; and
 - two buildings and structures including the National Temperance Hospital and Gloucester Gate Bridge contained features with a moderate potential to support roosting bats.
- 2.4.8 Following the initial assessment, National Temperance Hospital was subject to detailed inspection involving an external survey and internal survey. The detailed inspection found that the building only had features with low potential to support roosting bats and therefore this building was downgraded to low potential.
- 2.4.9 Emergence surveys were carried out at Gloucester Gate Bridge. No bat roosts were recorded. Low numbers of common and soprano pipistrelles were recorded foraging and commuting around the bridge, which was subject to high levels of light pollution. Single passes of noctule and brown long-eared bat were also recorded.
- 2.4.10 The desk study did not report any records which are relevant to the baseline for the Proposed Scheme.
- 2.4.11 Whilst no bat roosts were recorded during the survey, it is not possible to rule out buildings which have not been inspected or surveyed in this area including a small number of pubs, residential and office buildings. Given the urban environment and available field and desk study data, it is likely roosts would comprise common species. The presence of maternity roosts cannot be excluded.

Bat activity surveys

- 2.4.12 No activity transects or static surveys were carried out in CFA1 because there were no significant landscape features of particular interest for bats.

Discussion

- 2.4.13 Building and tree roost opportunities are limited, and if bats are present small roosts of common species are most likely. Given the highly urbanised landscape the presence of maternity roosts, for example at St James's Garden, is unlikely but cannot be ruled out. If key foraging areas exist they will be limited to small greenspaces near the Proposed Scheme. No key commuting routes have been identified.

CFA 2

- 2.4.14 The known species assemblage recorded during the field surveys included common pipistrelle, soprano pipistrelle and one or more *Myotis* species including Daubenton's bat *Myotis daubentonii*.

Roosting (trees)

- 2.4.15 The initial assessment of trees included streetside trees within the Proposed Scheme and trees in Camden Gardens public open space. Of the trees surveyed:

- no confirmed roosts were recorded;
- no trees with high potential to support bat roosts were recorded; and
- two trees containing features with a moderate potential to support roosting bats were recorded in Camden Gardens.

- 2.4.16 No further detailed surveys (such as tree climbing or emergence surveys) were undertaken due to access constraints. This makes it difficult to draw any conclusions about how bats use the trees.

- 2.4.17 The desk study did not report any records which are relevant to the baseline for the Proposed Scheme.

- 2.4.18 It is likely that any tree roosts in this area would be limited to a small number of trees in Camden Gardens. It is likely that if present they would comprise small roosts of common species, however the presence of a maternity roost cannot be ruled out.

Roosting (buildings and structures)

- 2.4.19 A total of 86 buildings or other structures (including bridges and railway arches) were subject to initial assessment:

- 2.4.20 Of these buildings and structures;

- no confirmed roosts were recorded, and
- buildings and structures which may have roost potential were recorded during a walkover survey at Camden Road Station, railway arches at Camden Gardens, railway arches between Haven Street and Torbay Street, railway arches to the south of Chalk Farm Road, the former Primrose Hill Station, a

tunnel at the former Primrose Hill Station, and the Regent's Park Road pedestrian bridge. No further detailed surveys (such as emergence surveys) were undertaken due to access constraints.

- 2.4.21 The desk study did not report any records which are relevant to the baseline for the Proposed Scheme.

Bat activity surveys

- 2.4.22 Table 1 provides details of the bat activity transect surveys conducted.
- 2.4.23 The following bat species have been recorded during the bat activity surveys conducted in support of the Proposed Scheme in this area:
- common pipistrelle;
 - soprano pipistrelle; and
 - *Myotis* species.

Table 1: Bat activity surveys conducted within CFA 2

| Ecology survey code | Transect or static location | Number of surveys conducted | First survey date | Final survey date | CFA | Map Reference |
|---------------------|---------------------------------|-----------------------------|-------------------|-------------------|-----|---------------|
| 010-BA1-H-001001 | Transect: Regent's Canal Camden | 10 | 24th April 2013 | 2nd August 2013 | 2 | EC-06-006 |

- 2.4.24 No static detector surveys were carried out. Table 2 provides details of the data collected during the bat activity transect surveys.

Table 2: Bat activity transect survey results - 010-BA1-H-001001

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|-------------------------------|-----------------------|--------------------------|-------------------------|--------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-H-001001 | Regent's Canal Camden | | | | This transect covers a heavily urbanised, concrete environment with little vegetation until the westernmost end where it is flanked by mature vegetation, a large Norman church and London Zoo. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ² | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ³ | Rain (0-5) ⁴ | Wind (0-12) ⁵ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | Nl | Es | Ny/Es |
| Visit 1: Dusk 24th April 2013 | 18 | 8 | 2 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 2: Dawn 25th April 2013 | 13.4 | 7 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 3: Dusk 13th May 2013 | 11 | 4 | 0 | 6 | 9 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 4: Dawn 14th May 2013 | 8.5 | 6 | 0 | 2 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 5: Dusk 3rd June 2013 | 14.1 | 0 | 0 | 0 | 20 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 6: Dawn 4th June 2013 | 10.8 | 0 | 0 | 0 | 16 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 7: Dusk 8th July 2013 | 23 | 0 | 1 | 1 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |

² Pp - common pipistrelle, Ppy - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb - whiskered/ Brandt's bat, M sp. - *Myotis* bat species, Pa - brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, Nl - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

³ Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

⁴ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

⁵ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|-----------------------------|-----------------------|--------------------------|-------------------------|--------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-H-001001 | Regent's Canal Camden | | | | This transect covers a heavily urbanised, concrete environment with little vegetation until the westernmost end where it is flanked by mature vegetation, a large Norman church and London Zoo. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ² | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ₃ | Rain (0-5) ₄ | Wind (0-12) ₅ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es |
| Visit 8: Dawn 9th July 2013 | 14 | 0 | 0 | 1 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 9: 1st August 2013 | 28 | 0 | 0 | 1 | 11 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 10: 2nd August 2013 | 19 | 1 | 0 | 1-3 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

- 2.4.25 Regular, low level, dispersed commuting and foraging activity from common and soprano pipistrelle bats was recorded on the Grand Union Canal along the transect route.
- 2.4.26 There were also occasional, individual foraging and commuting passes from *Myotis* species. On the basis of call shape and slope these were probably Daubenton's bats.

Discussion

- 2.4.27 Building and tree roost opportunities are limited, and if bats are present small roosts of common species are most likely. Given the highly urbanised landscape the presence of maternity roosts is unlikely but cannot be ruled out. The transect survey along the Grand Union (Regent's) Canal recorded regular, low level, dispersed commuting and foraging activity from common and soprano pipistrelle bats with occasional, individual foraging and commuting passes from *Myotis* species bats. Other small areas of potential foraging habitat such as North London Line at York Way Site of Borough Importance Grade 2 (SBI.II) occur along the railway land and are of low importance. The North London Line at York W SBI Grade 2, which comprises a linear habitat of trees and scrub along both sides of the railway between York Way and Camley Street, 20m to the north of the Proposed Scheme at its closest point, is also considered to provide habitat for commuting and foraging bats.

CFA 3

- 2.4.28 The known species assemblage recorded during the field surveys included common pipistrelle, soprano pipistrelle, brown long-eared bat and one or more *Myotis* species.

Roosting (trees)

- 2.4.29 The initial assessment of trees included streetside trees within the Proposed Scheme. Of the trees surveyed:
- one tree roost was confirmed where bat droppings were found within a cavity in the trunk of a mature lime tree on Avenue Road. The bat species could not be confirmed as the DNA analysis on this sample was not successful, potentially due to degradation of the droppings in the exposed cavity;
 - another mature lime tree on Avenue Road contained features with a high potential to support roosting bats; and
 - three trees contained features with a moderate potential to support roosting bats. These were mature streetside trees on Finchley Road, Greville Road and on the B509 (Belsize Road/Hilgrove Road) roundabout respectively.
- 2.4.30 During the first emergence survey of the confirmed tree roost, it was found that the roosting cavity had caved in since the initial inspection and was no longer suitable as a bat roost. Therefore this tree was subsequently downgraded to having low potential to support roosting bats and is not shown on the maps.
- 2.4.31 Emergence surveys were also undertaken of the high potential tree and two of the moderate potential trees. No bat roosts were identified during the emergence surveys.
- 2.4.32 The desk study did not report any records which are relevant to the baseline for the Proposed Scheme.
- 2.4.33 A small number of mature street trees in this area may support bat roosts of common species, though none were recorded during the field surveys. The potential for trees which could not be viewed, for example in Adelaide LNR and Chalk Farm

Embankment and Adelaide Nature Reserve Site of Borough Importance Grade 1 (SBI.I) to support bats cannot be ruled out and may support maternity roosts of common species and possibly roosts of rarer species.

Roosting (buildings and structures)

- 2.4.34 A total of ten buildings or other structures were subject to initial assessment. Of these buildings and structures:
- the Gloucester Avenue Bridge was found to contain features with a moderate potential to support roosting bats.
- 2.4.35 The subsequent emergence surveys carried out at the Gloucester Avenue Bridge revealed small numbers of common pipistrelles either emerging from the bridge or an immediately adjacent London plane tree. Multiple bats were recorded foraging around the bridge, including five or more common pipistrelles and two or more *Myotis* species. Small groups of soprano pipistrelles were recorded heading east past the bridge indicating a roost nearby.
- 2.4.36 The Up-Empty Carriage Tunnel was subject to an internal inspection during the hibernation season in February 2013. During the inspection it was confirmed as a hibernation roost when one hibernating bat of unknown species was found roosting in the Euston (southern) end of the tunnel. During a combined emergence and autumn swarming survey of the Up-Empty Carriage Tunnel in August 2013, four common pipistrelle bats emerged from the Euston (southern) end of the tunnel. This confirms the tunnel as a summer roost for a small number of common pipistrelles. No swarming behaviour was observed.
- 2.4.37 The Western Horse Tunnel, which lies above the Up-Empty Carriage Tunnel, was subject to a partial internal inspection in August 2013. The part of the Western Horse Tunnel that could be accessed for the inspection technically lies within CFA2 however the majority of the tunnel is within CFA3 and so it is dealt with in this section alongside the Up-Empty Carriage tunnel to which it is connected via a vertical shaft. The part of the tunnel which could be accessed was found to contain features with a moderate summer roost potential and features with a high potential to support hibernating bats. A combined emergence and autumn swarming survey at the entrances to the Western Horse Tunnel in August 2013 revealed no emerging bats and no swarming behaviour was observed.
- 2.4.38 The desk study did not report any records which are relevant to the baseline for the Proposed Scheme.
- 2.4.39 Details of confirmed roosts in buildings/structures in CFA3 are provided in Table 3.

Table 3: Confirmed bat roosts in buildings/structures in CFA 3

| Ecology survey code | Location | OS grid reference | Building/structure type | Species confirmed utilising roost and (peak count) | Date of peak count and nature of survey | Roost type | Roost description | CFA | Approximate distance from the Proposed Scheme |
|---------------------|----------------------------------|-------------------|-------------------------------------|--|---|---|---|-----|---|
| 010-BS3-002001 | Gloucester Avenue | TQ 283 839 | Bridge (or tree adjacent to bridge) | Common pipistrelle (up to 5) | 24.06.13 Emergency survey | Summer day roost of small numbers of bats | Exact roost location not confirmed. Roost is either in bridge or the immediately adjacent tree. | 3 | Within |
| 010-BS3-002009 | Up-Empty Carriage Tunnel, Camden | TQ 282 842 | Disused railway tunnel | Unconfirmed (1) | 01/02/2013 hibernation roost visit | Hibernation | Rivet hole in metal lining of tunnel, approximately 10m inside the Euston (south) end of tunnel. | 3 | Within |
| 010-BS3-001010 | Up-Empty Carriage Tunnel | TQ 282 842 | Disused railway tunnel | Common pipistrelle (4) | 22.08.13 Emergency and swarming survey of tunnel | Summer day roost of small numbers of bats | Not confirmed but likely in holes in metal lining of tunnel walls / between metal lining and brick-lined section. | 3 | Within |

Bat activity surveys

2.4.40 Table 4 provides details of the bat activity transect surveys conducted in support of the scheme in CFA3.

Table 4: Bat activity surveys conducted within CFA 3

| Ecology survey code | Transect or static location | Number of surveys conducted | First survey date | Final survey date | CFA | Map Reference |
|---------------------|--|--|----------------------------------|-----------------------------------|-----|---------------|
| 010-BA2-001001 | Static: Up-Empty Carriage Tunnel - Euston (South) End approximately 30 m into the tunnel | 7 nights 25th July 2013 - 1st August 2013, 17 nights 8th August 2013- 27th August 2013 | 25th July 2013 - 1st August 2013 | 8th August 2013- 27th August 2013 | 3 | EC-06-003b |

| Ecology survey code | Transect or static location | Number of surveys conducted | First survey date | Final survey date | CFA | Map Reference |
|---------------------|---|--|----------------------------------|-----------------------------------|-----|---------------|
| 010-BA2-002001 | Static: Up-Empty Carriage Tunnel Adelaide Road (West) End approximately 30 m into the tunnel | 7 nights 25th July 2013 - 1st August 2013, 17 nights 8th August 2013- 27th August 2013 | 25th July 2013 - 1st August 2013 | 8th August 2013- 27th August 2013 | 3 | EC-06-007b |

2.4.41 The following bat species were recorded during the static detector surveys;

- common pipistrelle;
- soprano pipistrelle;
- brown long-eared bat;
- Pipistrellus species; and
- *Myotis* species.

2.4.42 Table 5 and Table 6 provide summaries of the data collected during the static activity surveys conducted in support of the scheme in this area.

Appendix EC-003-001

Table 5: Summary of static detector monitoring results for 010-BA2-001001

| Ecology survey code | Static Location | | OS Grid | | | | Description of habitat | | | | | | | | | | | | |
|--|---|------------------------------------|---|-----|----|-------|---|----|----|----|-----|--------|-------|----|----|----|----|----|--------|
| 010-BA2-001001 | Up-Empty Carriage Tunnel - Euston (South) End | | TQ 285 838 | | | | Disused railway tunnel. Approximately 30 metres inside the tunnel entrance, mounted on the tunnel wall. | | | | | | | | | | | | |
| Date (night monitoring commenced to night monitoring ceased) | | Number of nights detector deployed | Species peak night count during monthly monitoring 110 ⁶ | | | | | | | | | | | | | | | | |
| | | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/ Ep |
| 25th July 2013 - 1st Aug 2013 | | 7 | 110 | 11 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8th Aug - 27th Aug | | 17 | 133 | 8 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 6: Summary of static detector monitoring results for 010-BA2-002001

| Ecology survey code | Static Location | OS Grid | Description of habitat | | | | | | | | | | | | | | | | |
|--|---|--|---|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|--------|--|
| 010-BA2-002001 | Up-Empty Carriage Tunnel Adelaide Road (West) End | TQ 2789 8435 | Disused railway tunnel. Approximately 30 metres inside the tunnel entrance, mounted on the tunnel wall. | | | | | | | | | | | | | | | | |
| Date (night monitoring commenced to night monitoring ceased) | Number of nights detector deployed | Species peak night count during monthly monitoring | | | | | | | | | | | | | | | | | |
| | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/ Ep | |
| 25th July 2013 - 1st Aug 2013 | 7 | 92 | 7 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 8th Aug - 27th Aug | 17 | 109 | 7 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | |

⁶ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb - whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa - brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

- 2.4.43 High numbers of passes of common pipistrelle and low numbers of passes of soprano pipistrelle and *Pipistrellus* species were recorded in both ends of the Up Empty Tunnel during both July and August. However, average numbers of common pipistrelle per night were much lower in both ends of the Up-Empty Carriage Tunnel. These were calculated as 29 and 35 passes per night for July and August respectively in the Adelaide Road (west) end, 46 and 29 passes per night for July and August respectively in the Euston (south) end. This would indicate that only small numbers of bats use the tunnels with peaks of activity likely to be linked to prolonged foraging bouts. The figures also indicate that one end of the tunnel does not appear to be more regularly used than the other.
- 2.4.44 As the detectors were placed 30m inside the tunnel it is unlikely that they recorded bats flying outside the tunnel entrance.
- 2.4.45 In the Euston end (south), over the seven nights of recording in July, one soprano pipistrelle was recorded 5 minutes after sunset, indicating it was probably roosting inside the tunnel or very close to it. The remaining soprano pipistrelle contacts occurred later than 20 minutes after sunset and are more consistent with bats flying in to forage.
- 2.4.46 Throughout the survey periods in July and August in the Adelaide Road end, there were no passes in the first 20 minutes of sunset other than on the 28.07.13 and 27.08.13 when a single common pipistrelle was recorded 13 and 19 minutes respectively after sunset. This would indicate that bats are not regularly using the Adelaide Road end of the tunnel for roosting.
- 2.4.47 *Myotis* bats were recorded in the Adelaide Road end (north) of the tunnel in July, but were absent from the Euston end (south). Similarly *Myotis* bats were recorded in the Euston end of the tunnel in August, but were absent from the Adelaide Road end. The data would therefore indicate that these *Myotis* sp individuals were not passing through the tunnel. These bats were recorded on one night in July around 1:30am and on two occasions in August - 22:40 and 22:43 on 25.08.13 and at 01:56 on 26.08.13. As such, *Myotis* bats are likely to be using the tunnel only on an occasional basis for foraging rather than roosting. Brown long-eared was recorded on two nights in August in the Adelaide Road end only. The recordings were made at 04:15 on 08.08.13 and 02:15 and 02:16 on 09.08.13. As per *Myotis* bats, the data would indicate that bats of this species are only using the tunnel on an occasional basis for foraging rather than roosting and are not moving through the tunnel.

Discussion

- 2.4.48 The desk study did not return any records of bat roosts in the area. There are several records of common pipistrelle and *Myotis* sp., and one record of noctule on the Regent's Canal near the two entrances to the Western Horse Tunnel, between Southampton Bridge/Oval Road (see CFA2) and Fitzroy Bridge (Gloucester Avenue Bridge). There are also records of Nathusius' pipistrelle (*Pipistrellus nathusii*), soprano pipistrelle and common pipistrelle in CFA3 but these were not close to the Proposed Scheme.

- 2.4.49 Surveys carried out at the Gloucester Avenue Bridge found a small summer day roost of common pipistrelle bats either in the bridge itself or in an adjacent tree. Common pipistrelle, soprano pipistrelle and *Myotis* sp, were recorded foraging on the canal adjacent to the bridge during the survey.
- 2.4.50 Surveys carried out at the Up-Empty Carriage Tunnel found a small summer day roost of common pipistrelles and possibly soprano pipistrelles. The tunnel is also used by foraging pipistrelles of both species, plus small numbers of brown long-eared bat, and one or more *Myotis* species. The tunnel was also confirmed as a hibernation roost following a survey in February 2013 although species and numbers are unknown.
- 2.4.51 No bats were seen emerging from or swarming at the Western Horse Tunnel during the one combined emergence and autumn swarming survey carried out in August. However this tunnel is connected to the Up-Empty Carriage tunnel where summer roosting and hibernating bats have been confirmed.

CFA 4

- 2.4.52 The species assemblage recorded in CFA₄ included common pipistrelle, soprano pipistrelle, noctule, serotine (*Eptesicus serotinus*), a *Nyctalus* / *Eptesicus* species and one or more *Myotis* species.

Roosting (trees)

- 2.4.53 Streetside trees within the Proposed Scheme (current at the time of survey) were subject to initial assessment, along with trees in Kensal Green Cemetery. Of the trees subject to initial assessment in CFA 4:
- no confirmed roosts were recorded;
 - no trees containing features with a high potential to support roosting bats were recorded; and
 - one tree recorded next to the canal near Hythe Road was found to contain features with a moderate potential to support roosting bats.
- 2.4.54 The tree next to the canal was initially viewed from PRoW. The only access to the tree was through private land where access had been refused, therefore no detailed surveys were undertaken at this tree.

Roosting (buildings and structures)

- 2.4.55 In CFA 4, 54 buildings and 38 tombs/mausoleums were subject to initial assessment. Of these;
- no confirmed roosts were recorded;
 - a brick built structure in the side of Victoria Road Bridge to the east of North Acton Railway Station with a high potential for hibernation roosts were recorded; and
 - 34 of the tombs/mausoleum and one building, a disused warehouse on Claremont Road was recorded containing features with a moderate potential to support roosting bats.

2.4.56 A detailed external inspection was carried out on the 38 tombs/mausoleums at Kensal Green Cemetery which fell within a 100m buffer of the Proposed Scheme at the time of the survey. All 38 structures were considered to have only low or negligible potential to support summer roosting bats and therefore no emergence surveys were required. It was noted that 34 of the 38 structures had thick, stone-walls with entrance points and were considered to have a high potential to support hibernating bats, the remaining 4 had low potential for hibernating roosts. No autumn swarming surveys were undertaken due to project timing restrictions.

2.4.57 The warehouse on Claremont Road, which was assessed as having moderate potential for summer roosting bats during the initial assessment, was subject to a detailed internal and external building inspection. The inspection found that the building was generally unsuitable for roosting bats due to high noise and light levels and unsuitable roofing materials. The building was downgraded to negligible potential and scoped out of the assessment, no further surveys were required.

Bat activity surveys

2.4.58 Table 7 provides details of the bat activity transect surveys conducted in support of the scheme in CFA4.

Table 7: Bat activity surveys conducted within CFA 4

| Ecology survey code | Transect or static location | Number of surveys conducted | First survey date | Final survey date | CFA | Map Reference |
|---------------------|--|---|---------------------------------|-------------------------------|-----|---------------|
| 010-BA1-007002 | Transect: Wormwood Scrubs and Little Wormwood Scrubs | 8 | 22nd April 2013 | 6th August 2013 | 4 | EC-06-011 |
| 010-BA1-007001 | Transect: GUC Old Oak Common | 14 | 2nd August 2012 | 7th August 2013 | 4 | EC-06-011 |
| 010-BA2-009001 | Static: GUC at Old Oak Common | 8 nights in June, 1 night in July, 7 nights in August | 20th June 2013 - 28th June 2013 | 8th August - 15th August 2013 | 4 | EC-06-012-R1 |

2.4.59 The following bat species have been recorded during the bat activity transect and static surveys conducted in support of the scheme in this area:

- common pipistrelle;
- soprano pipistrelle;
- noctule;
- serotine;
- *Nyctalus / Eptesicus* species;

- *Pipistrellus* species; and
- *Myotis* species.

2.4.60 Table 8 and Table 9 provide details of the data collected during the bat activity transect surveys conducted in support of the scheme in this area.

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Table 8: Bat activity transect survey results - Wormwood Scrubs and Little Wormwood Scrubs

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | | |
|-------------------------------|--|--------------|-------------|---------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|--|
| 010-BA1-007002 | Wormwood Scrubs and Little Wormwood Scrubs | | | | This transect covers open land including rough grassland and managed playing fields surrounded by scrubby vegetation, and a few mature trees along the railway edge. Little Wormwood Scrubs consists of managed amenity parkland with some mature trees and some rough grassland, which is surrounded by housing/buildings and railway lines. | | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ⁷ | | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8)8 | Rain (0-5)9 | Wind (0-12)10 | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es | |
| Visit 1: Dusk 22nd April 2013 | 9 | 8 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 2: Dawn 23rd April 2013 | 9 | 7-1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 3: Dusk 4th June 2013 | 15.7 | 0 | 0 | 3 | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 4: Dawn 5th June 2013 | 10.9 | 7 | 0 | 3 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 5: Dusk 9th July 2013 | 23 | 0 | 0 | 1-2 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | |
| Visit 6: Dawn 10th July 2013 | 13 | 0 | 0 | 0-1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 7: Dusk 5th August 2013 | 17 | 8 | 0 | 1 | 11 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

⁷ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb - whiskered/ Brandt's bat, M sp - Myotis bat species, Pa - brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

⁸ Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

⁹ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

¹⁰ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|-------------------------------|--|--------------|-------------|---------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-007002 | Wormwood Scrubs and Little Wormwood Scrubs | | | | This transect covers open land including rough grassland and managed playing fields surrounded by scrubby vegetation, and a few mature trees along the railway edge. Little Wormwood Scrubs consists of managed amenity parkland with some mature trees and some rough grassland, which is surrounded by housing/buildings and railway lines. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ⁷ | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8)8 | Rain (0-5)9 | Wind (0-12)10 | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | Nl | Es | Ny/Es |
| Visit 8: Dawn 6th August 2013 | 12-10 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.61 Regular, very low level, dispersed commuting and foraging activity from common and soprano pipistrelle bats was recorded on the Wormwood Scrubs and Little Wormwood Scrubs transect route along with a single noctule pass in July (not recorded as either foraging or commuting).

Table 9: Bat activity transect survey results - GUC Old Oak Common

| Ecology survey code | Transect Location | Description of habitats covered by transect |
|---------------------|--------------------|--|
| 010-BA2-009001 | GUC Old Oak Common | This is a section of the Grand Union Canal which starts at Ladbroke Grove B450 and ends where a railway crosses the Canal to the west of the Willesden Euro Terminal main compound. The canal is bounded on its north bank by Kensal Green Cemetery and St Mary's RC Cemetery, with a dense tree belt fronting the canal. Beyond that, the north bank is dominated by industrial warehouses. The south bank is bordered by the former gas works with large areas of semi-improved grassland, the Great Western Railway consisting of numerous tracks and railway associated buildings. |

| Visit number and date | Weather conditions | | | | Total species passes during transect survey ¹¹ | | | | | | | | | | | | | | | | |
|---------------------------------|--------------------|---------------------------|--------------------------|---------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| | Temp (°C) | Cloud (0-8) ¹² | Rain (0-5) ¹³ | Wind (0-12) ¹⁴ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | Nl | Es | Ny/Es |
| Visit 1: Dusk 2nd August 2012 | 16.1 | 7 | 0 | 2-3 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 2: Dusk 9th August 2012 | 17.6 | 7 | 0 | 0 | 7 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 3: Dawn 10th August 2012 | 16.3 | 5 | 0 | 0-1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 4: Dusk 24th October 2012 | 13 | 8 | 1 (light misty drizzle) | 1-2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 5: Dusk 23rd April 2013 | 9.1 | 0 | 0 | 0-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 6: Dawn 24th April 2013 | 7.8 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 7: Dusk 8th May 2013 | 15 | 8 | 0 | 6 | 2 | 8 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 8: Dawn 9th May 2013 | 9 | 2 | 0 | 2 | 18 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 9: Dusk 6th June 2013 | 20 | 0 | 0 | 2-3 | 8 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

¹¹ Pp - common pipistrelle, Ppy - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, Nl - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/Eptesicus bat.

¹² Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

¹³ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

¹⁴ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

| Ecology survey code | Transect Location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|--------------------------------|--------------------|---------------------------|--------------------------|---------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA2-009001 | GUC Old Oak Common | | | | This is a section of the Grand Union Canal which starts at Ladbroke Grove B450 and ends where a railway crosses the Canal to the west of the Willesden Euro Terminal main compound. The canal is bounded on its north bank by Kensal Green Cemetery and St Mary's RC Cemetery, with a dense tree belt fronting the canal. Beyond that, the north bank is dominated by industrial warehouses. The south bank is bordered by the former gas works with large areas of semi-improved grassland, the Great Western Railway consisting of numerous tracks and railway associated buildings. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ¹¹ | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ¹² | Rain (0-5) ¹³ | Wind (0-12) ¹⁴ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es |
| Visit 10: Dawn 7th June 2013 | 11 | 1 | 0 | 1-2 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 11: Dusk 10th July 2013 | 17.6 | 1 | 0 | 3 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| Visit 12: Dawn 11th July 2013 | 13.7 | 7.5 | 0 | 2 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 13: Dusk 6th August 2013 | 22 | 1 | 0 | 1 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 14: Dawn 7th August 2013 | 17 | 7 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.62 Very low levels of widely dispersed bat activity were observed on the Grand Union Canal at Old Oak Common during the 2012 surveys, including both commuting and foraging common and soprano pipistrelle bats. On Visit 1, four common pipistrelle bats were observed towards the western end of the transect commuting west to east followed closely by two further bats heard commuting but not seen

(which could also have been moving west to east). Soprano pipistrelle passes were much less frequent and no other species were recorded in 2012.

2.4.63 Higher levels of bat activity were observed at this site during 2013 though the transect was longer in 2013, with the exception of Visits 5 & 6, when no activity was observed. Both commuting and foraging by common and soprano pipistrelle bats was recorded.

2.4.64 Single passes of a *Myotis* species and serotine bat were recorded on Visit 11, although no other species were recorded on any other occasion. The activity was generally widely dispersed.

2.4.65 Table 10 provides details of the data collected during the bat activity static surveys conducted in support of the scheme in this area.

Table 10: Summary of static detector monitoring results for the GUC at Old Oak Common

| Ecology survey code | Static Location | | OS Grid | | | Description of habitat | | | | | | | | | | | | | |
|--|-----------------------|------------------------------------|--|-----|----|--|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA2-009001 | GUC at Old Oak Common | | TQ 2132482771 | | | Planted woodland/scrub along canal towpath | | | | | | | | | | | | | |
| Date (night monitoring commenced to night monitoring ceased) | | Number of nights detector deployed | Species peak night count during monthly monitoring ¹⁵ | | | | | | | | | | | | | | | | |
| | | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | Nl | Es | Ny/Ep |
| 20th June 2013 - 28th June 2013 | | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16th July 2013 - 17th July 2013 | | 2 | 12 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 8th August - 15th August 2013 | | 7 | 43 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.66 The static detectors deployed on the towpath of the Grand Union Canal at Old Oak Common recorded relatively low levels of activity from common and soprano pipistrelles and two passes from one of the larger bat species (*Eptesicus* or *Nyctalus sp.*).

¹⁵ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, Nl - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

Discussion

- 2.4.67 No bat roosts were found during the surveys carried out, although these were highly constrained by lack of access to carry out initial or more detailed work and it is considered that roosts of common species and potentially maternity roosts or roosts of rarer bats could be present.
- 2.4.68 The transect surveys recorded regular, very low level, dispersed commuting and foraging activity from common and soprano pipistrelle bats with occasional passes also recorded from noctule, *Myotis* sp and serotine. The only exception to this is an area of the Grand Union Canal north of Wormwood Scrubs where there was a slightly higher concentration of commuting bats (up to six common pipistrelles).
- 2.4.69 The static surveys recorded relatively low levels of activity from common pipistrelles and a single contact (two passes) of a larger bat species (*Eptesicus* or *Nyctalus*).
- 2.4.70 The desk study did not return any specific records of bats which added to the knowledge of the bat populations in the area.

CFA 5

- 2.4.71 The species assemblage recorded in CFA5 included common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule and one or more *Myotis* species.

Roosting (trees)

- 2.4.72 None of the trees assessed on Network Rail land (NWR) or TFL land in December 2012 and May 2013 respectively, in this CFA were identified as having more than low potential for roosting bats. A tree assessment was carried out for the whole of Perivale Wood in January 2013:
- no confirmed roosts were identified during initial assessment;
 - from the trees assessed within a 100m buffer of the September 2013 Proposed Scheme within Perivale Wood, six trees containing features with a high potential to support roosting bats were found, the nearest of which was 5m north of the Proposed Scheme; and
 - from the trees assessed within a 100m buffer of the September 2013 Proposed Scheme within Perivale Wood, 12 trees containing features with a moderate potential to support roosting bats, the nearest of which was 49m north of the Proposed Scheme were identified.
- 2.4.73 These trees at Perivale Wood were not subject to detailed inspection due to changes in the Scheme design following initial assessment which meant they were not within 100m of the Proposed Scheme.
- 2.4.74 Following the recent design changes in July 2013, there may be trees within 100m of the Proposed Scheme on NWR or TFL land which have not been subject to an assessment.

Roosting (buildings and structures)

- 2.4.75 In CFA 5, 51 buildings or other structures were subject to initial assessment. No confirmed roosts, or buildings or structures containing features with a high potential to support roosting bats, were recorded.
- 2.4.76 Two residential buildings containing features with a moderate potential to support roosting bats were recorded within the Proposed Scheme, in a construction compound next to the Mandeville Road vent shaft main compound. A detailed inspection of these buildings was not undertaken due to access constraints.

Bat activity surveys

- 2.4.77 Table 11 provides details of the bat activity transect surveys conducted in support of the scheme in this area.

Table 11: Bat activity surveys conducted within CFA 5

| Ecology survey code | Transect location | Number of surveys conducted | First survey date | Final survey date | CFA | Map Reference |
|---------------------|--|---|---------------------------------------|---------------------------------------|-------|---------------|
| 010-BA1-011001 | Transect: NWR land between Park Royal and Alperton Lane | 6 (3 dusk, 3 dawn) | 24th April 2013 | 31st July 2013 | 5 | EC-06-014 |
| 010-BA1-015001 | Transect: Perivale Wood | 1 (dusk) | 18th October 2012 | 18th October 2012 | 5 | EC-06-016 |
| 010-BA1-015002 | Transect: NWR land between Perivale Wood and Grand Union Canal, Greenford. | 8 (4 dusk, 4 dawn) | 28th May 2013 | 7th August 2013 | 5 | EC-06-016 |
| 010-BA1-017001 | Transect: Grand Union Canal towpath, Greenford. | 6 (3 dusk, 3 dawn) | 18th July 2012 | 24th October 2012 | 5 | EC-06-017 |
| 010-BA1-020001 | Transect: NWR land between Mandeville Road vent and South Ruislip Station | The survey results for this transect route are presented and discussed in CFA6. | | | 5 & 6 | EC-06-019 |
| 010-BA2-015001 | Static: Perivale Wood | 1 | 18th October 2013 - 25th October 2013 | 18th October 2013 - 25th October 2013 | 5 | EC-06-016 |
| 010-BA2-017001 | Static: Network Rail Land adjacent to Mandeville vent shaft main compound. | 3 | 21st June 2013 - 28th June 2013 | 8th Aug 2013 - 15th Aug 2013 | 5 | EC-06-017 |

2.4.78 The following bat species have been recorded during the range of bat activity transect and static surveys conducted in support of the scheme in this area:

- common pipistrelle;
- soprano pipistrelle;
- Nathusius' pipistrelle;
- noctule; and
- *Myotis* species.

2.4.79 Table 12 to Table 15 provide details of the data collected during the bat activity transect surveys conducted in support of the scheme in this area.

Appendix EC-003-001

Table 12: Bat Activity Transect Survey Results - NWR Park Royal to Alpertown Lane 010-BA1-011001

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | | |
|-------------------------------|---|---------------------------|--------------------------|---------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|--|
| 010-BA1-011001 | NWR land between Park Royal and Alperton Lane | | | | This transect includes scrub, tall ruderals and trees alongside the railway, which passes through urban industrial estates in Park Royal, underneath the A40 at Hanger Lane and over the River Brent to Alperton Lane. | | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ¹⁶ | | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ¹⁷ | Rain (0-5) ¹⁸ | Wind (0-12) ¹⁹ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es | |
| Visit 1: Dusk 24th April 2013 | 20 | 8 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 2: Dawn 25th April 2013 | 14 | 2 | 0 | 6-2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 3: Dusk 26th June 2013 | 20.5 | 3 | 0 | 2 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 4: Dawn 27th June 2013 | 14.5 | 5 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 5: Dusk 30th July 2013 | 21 | 1 | 0 | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 6: Dawn 31st July 2013 | 17 | 7 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

¹⁶ Pp - common pipistrelle, Ppy - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/Eptesicus bat.

¹⁷ Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

¹⁸ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

¹⁹ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

- 2.4.80 Very low levels of widely dispersed bat activity were observed on Network Rail Park Royal to Alperton Lane. This consisted of small numbers of passes of both commuting and foraging common pipistrelle bats and occasional passes of soprano pipistrelle bats. Single passes of *Myotis* species were recorded during the first two visits in April but this was not observed on the later visits.

Table 13: Bat activity transect survey results - Perivale Wood 010-BA1-015001

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|---------------------------------|--------------------|---------------------------|--------------------------|---------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-015001 | Perivale Wood | | | | This is one of the few areas of ancient woodland remaining in London and is dominated by large mature oaks containing many holes and cavities. The woodland is actively managed by the Selbourne Society, London's oldest wildlife group. Within the woodland there are two large areas of rough grassland grazed by horses, one large pond and two smaller ponds. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ²⁰ | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ²¹ | Rain (0-5) ²² | Wind (0-12) ²³ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es |
| Visit 1: Dusk 18th October 2012 | 14.4 | 8 | 0 | 0-1 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

- 2.4.81 Very low levels of bat activity were observed at Perivale Wood during the single visit in October 2012. Activity was confined to the south of the transect. Common pipistrelle bats were observed both commuting and foraging and single passes of soprano pipistrelle and noctule were also recorded. It is likely that higher levels of activity would be observed at other times of the year.

²⁰ Pp - common pipistrelle, Ppy - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa - brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

²¹ Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

²² Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

²³ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

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Table 14: Bat activity transect survey results - NWR Perivale to Northolt 010-BA1-015002

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | | |
|-------------------------------|--|---------------------------|--------------------------|---------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|--|
| 010-BA1-015002 | NWR land between Perivale Wood and Grand Union Canal, Greenford. | | | | This transect is flanked by mature trees at the eastern end. The middle section comprises industrial units and housing on both sides, with some mature trees. The western end consists of scrub and mature trees. There is a small section of reeds and allotments where the line crosses the canal. | | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ²⁴ | | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ²⁵ | Rain (0-5) ²⁶ | Wind (0-12) ²⁷ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | Nl | Es | Ny/Es | |
| Visit 1: Dusk 28th May 2013 | 10 | 3 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 2: Dawn 29th May 2013 | 10 | 6 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 3: Dusk 3rd June 2013 | 14 | 2 | 0 | 2-4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 4: Dawn 4th June 2013 | 9 | 2 | 0 | 1 | 2 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 5: Dusk 2nd July 2013 | 16 | 8 | 0 | 4-6 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 6: Dawn 3rd July 2013 | N/R | N/R | 4 | N/R | Survey cancelled due to poor weather. | | | | | | | | | | | | | | | | | |
| Visit 7: Dusk 6th August 2013 | 17 | 3 | 0 | 1 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

²⁴ Pp - common pipistrelle, Ppy - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, Nl - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

²⁵ Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

²⁶ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

²⁷ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|-------------------------------|--|---------------------------|--------------------------|---------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-015002 | NWR land between Perivale Wood and Grand Union Canal, Greenford. | | | | This transect is flanked by mature trees at the eastern end. The middle section comprises industrial units and housing on both sides, with some mature trees. The western end consists of scrub and mature trees. There is a small section of reeds and allotments where the line crosses the canal. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ²⁴ | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ²⁵ | Rain (0-5) ²⁶ | Wind (0-12) ²⁷ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | Nl | Es | Ny/Es |
| Visit 8: Dawn 7th August 2013 | 16 | 7 | 0 | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.82 Very low levels of widely dispersed bat activity were observed on the Network Rail transect between Perivale Wood and the Grand Union Canal, Greenford. This comprised small numbers of passes of both commuting and foraging common pipistrelle bats and foraging soprano pipistrelle bats. A single pass of a *Myotis* species was recorded during Visit 5.

Table 15: Bat activity transect survey results - Grand Union Canal at Greenford, Ealing - 010-BA1-017001

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|---------------------|--------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 010-BA1-017001 | Grand Union Canal towpath, Greenford | | | | This section of the grand union canal is bounded on both sides by industrial development, mainly constructed over the last 20 years. There are trees along the north bank between the canal and the warehouses. There is a small wetland SINC on the north side beside the existing rail bridge which crosses the canal. | | | | | | | | | | | | | | | | |

| Visit number and date | Weather conditions | | | | Total species passes during transect survey ²⁸ | | | | | | | | | | | | | | | | |
|---------------------------------|--------------------|---------------------------|--------------------------|---------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| | Temp (°C) | Cloud (0-8) ²⁹ | Rain (0-5) ³⁰ | Wind (0-12) ³¹ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | Nl | Es | Ny/Es |
| Visit 1: Dusk 18th July 2012 | 18.4 | 8 | 0 | 2 | 24 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 2: Dusk 26th July 2012 | 18 | 0 | 0 | 0-1 | 24 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 3: Dusk 8th August 2012 | 19.1 | 4 | 0 | 1 | 20 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 4: Dawn 9th August 2012 | 17.3 | 5 | 0 | 1 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 5: Dusk 23rd October 2012 | 13.8 | 8 | 1 | 1 | 6 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 6: Dawn 24th October 2012 | 13 | 8 | 1 (light misty drizzle) | 1-2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.83 Regular, low level, dispersed commuting and foraging activity from common and soprano pipistrelle bats was recorded on the Grand Union Canal in Greenford transect. Of note are several areas with more concentrated foraging activity (greater than five individual bats actually observed) of either common pipistrelle bats or common and soprano pipistrelle bats together recorded on Visits 2 and 3. Low numbers of *Myotis* species passes were recorded and a single pass of a Nathusius' pipistrelle was recorded on Visit 3.

²⁸ Pp - common pipistrelle, Ppy - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, Nl - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

²⁹ Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

³⁰ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

³¹ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

2.4.84 Table 16 to Table 17 provide details of the data collected during the bat activity static surveys conducted in support of the scheme in this area.

Table 16: Summary of Static Detector Monitoring Results for 010-BA2-015001

| Ecology survey code | Static Location | OS Grid | | Description of habitat | | | | | | | | | | | | | | | |
|--|--|------------------------------------|---|---|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA2-015001 | Perivale Wood on north side of pond in southwest corner of site. | TQ158, 836 | | Perivale Wood is a site of ancient woodland with ponds and ditch habitat. It is bounded by the rail corridor to the south and the Grand Union Canal to the north. | | | | | | | | | | | | | | | |
| Date (night monitoring commenced to night monitoring ceased) | | Number of nights detector deployed | Species peak night count during monthly monitoring 18 | | | | | | | | | | | | | | | | |
| | | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Ep |
| 18th October 2012 - 25th October 2012 | | 7 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.85 The static detector deployed adjacent to the pond at Perivale Wood for one week in mid-October 2012 recorded very low levels of dispersed common pipistrelle passes and a single pass of a soprano pipistrelle.

Table 17: Summary of Static Detector Monitoring Results for 010-BA2-017001

| Ecology survey code | Static Location | OS Grid | Description of habitat | | | | | | | | | | | | | | | | |
|--|--|---------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA2-017001 | Network Rail Land adjacent to Mandeville vent shaft main compound. | TQ 13435 84475 | Railway side embankment with low scrub and trees | | | | | | | | | | | | | | | | |
| Date (night monitoring commenced to night monitoring ceased) | | Number of nights detector | Species peak night count during monthly monitoring ³² | | | | | | | | | | | | | | | | |
| | | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Ep |

³² Pp - common pipistrelle, Ppy - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - Myotis bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

| | deployed | | | | | | | | | | | | | | | | | |
|---------------------------------|----------|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21st June 2013 - 28th June 2013 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25th July 2013 - 1st Aug 2013 | 7 | 18 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8th Aug 2013 - 15th Aug 2013 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.86 The static detectors installed on the Network Rail Land adjacent to Mandeville vent shaft main compound recorded extremely low levels of activity from common and soprano pipistrelles only.

Discussion

- 2.4.87 The transect route on Network Rail land between Park Royal and Alperton Lane recorded very low levels of common and soprano pipistrelle activity and two single passes of a *Myotis* species on the first dusk / dawn survey in April 2013. The desk study did not uncover any bat records which added to the knowledge gained from field surveys for this first stretch of CFA5. These survey findings reflect the very urban nature of the environment either side of this transect.
- 2.4.88 Records of noctule, common pipistrelle and soprano pipistrelle were reported during the desk study at Perivale Wood. One noctule pass was recorded during the only transect survey within Perivale Wood carried out in mid-October 2012. The single static survey carried out Perivale Wood in mid-October 2012 recorded only low levels of common and soprano pipistrelles. The four dusk / dawn transect surveys carried out on the Network Rail land between Perivale Wood and the Grand Union Canal at Greenford recorded low levels of both common and soprano pipistrelles and a single pass of a *Myotis* species. Since both high and moderate potential tree roosts were identified within 100m of the land required for the Proposed Scheme in the south of Perivale Wood, given the activity survey results, the possibility that these trees may support maternity roosts of species including noctule, together with non-maternity roosts of these species cannot be ruled out.
- 2.4.89 Higher levels of foraging and commuting common and soprano pipistrelles were recorded along the Grand Union Canal towpath at Greenford with occasional passes of *Myotis* species and a single pass of a Nathusius' pipistrelle. These findings show that the Grand Union Canal is likely to be the most significant foraging and commuting habitat in CFA5. There were no records found through the desk study that added to the knowledge of the gained from field surveys for the Canal at Greenford.
- 2.4.90 CFA 6
- 2.4.91 The species assemblage recorded from field survey in CFA6 included common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, Leisler's *Nyctalus leisleri*, serotine, brown long-eared, a *Nyctalus* / *Eptesicus* species and *Myotis* species, including at least Natterer's bat *Myotis nattereri*.

Roosting (trees)

- 2.4.92 Trees within the Proposed Scheme (current at the time of survey) were assessed, including trees on Network Rail land, streetside trees and the majority of farmland trees where access was available.
- 2.4.93 Of the trees subject to initial assessment in CFA6:
- no confirmed roosts were recorded;
 - 63 trees contained features with a high potential to support roosting bats (36 of which formed part of Copthall Covert); and
 - 49 trees contained features with a moderate potential to support roosting bats (23 of which formed part of Copthall Covert).

- 2.4.94 Detailed climbing inspections were carried out on 62 of these trees with high or moderate potential including four trees at Gatemead Farm, two trees at Oak Farm, 27 trees at Copthall Farm, 23 in Copthall Covert and six trees in the field between the railway line and Copthall Covert. A total of 44 trees out of the 62 climbed, were downgraded to low or negligible potential following the climbing inspections.
- 2.4.95 A total of 21 trees were subject to emergence and dawn surveys, including six at Gatemead Farm, two at Oak Farm, 11 at Copthall Farm and two in the field between the railway land and Copthall Covert. The woodland at Copthall Covert and the mature tree lines either side of the bridleway southwest of Gatemead Farm were covered by back tracking surveys for reasons explained in the deviations section. The results of these surveys are summarised in the activity survey section.
- 2.4.96 During walkover surveys at Brackenbury Farm and the pharmaceutical research facility west of Breakspear Road South it was noted that there were a number of mature trees that may have bat potential. No further surveys on these trees were possible due to access restrictions.
- 2.4.97 Following the emergence and dawn surveys and back tracking surveys of trees in CFA6, seven trees with confirmed roosts were identified. All of the tree roosts identified appeared to support just one or two pipistrelle bats and are therefore likely to be male or non-breeding female transitory day roosts. The details of these seven confirmed roosts are provided in Table 18 below.

Table 18: Confirmed tree roosts within CFA 6

| Ecology survey code | Location | OS grid reference | Tree species | Species confirmed as utilising roost and (peak count) | Date of peak count and nature of survey | Roost type | Roost description | CFA | Approximate distance from the Proposed Scheme |
|---------------------|---------------|-------------------|--------------|---|---|---|--|-----|---|
| 010-BT3-024010 | Oak Farm | TQ735732 | Oak | 1 x soprano pipistrelle | 31.07.13 Emergence | Day roost of single bat, probably male or non-breeding female | Bat emerged from tree stump around 4 m up on south side of tree. | 6 | Within Proposed Scheme |
| 010-BT3-025009 | Copthall Farm | TQ645656 | Oak | 1 x soprano pipistrelle | 21.05.13 Emergence | Day roost of single bat, probably male or | Exact emergence location not identified. | 6 | Within Proposed Scheme |

| Ecology survey code | Location | OS grid reference | Tree species | Species confirmed as utilising roost and (peak count) | Date of peak count and nature of survey | Roost type | Roost description | CFA | Approximate distance from the Proposed Scheme |
|---------------------|--------------------------------------|-------------------|--------------|---|--|---|--|-----|---|
| | | | | | | non-breeding female | | | |
| 010-BT3-025024 | Copthall Farm | TQ647 867 | Oak | 1 bat, probably soprano pipistrelle | 16.07.13 Emergence | Day roost of single bat, probably male or non-breeding female | Exact emergence location not identified. | 6 | Within Proposed Scheme |
| 010-BT3-025050 | Copthall Covert | TQ670 713 | Oak | 1 x Pipistrellus species | 11.07.13 Emerging bat seen during back tracking survey but not picked up on detector. 12.07.13 Backtracking survey at dawn 01.08.13 Backtracking survey at dusk 13.08.13 Emergence survey | Day roost of single bat, probably male or non-breeding female | South-facing branch at head height. | 6 | Within Proposed Scheme |
| 010-BT1-024025 | Bridleway southwest of Gatemead Farm | TQ710 741 | Oak | 2 (possibly 3) common pipistrelle | 09.08.13 Back tracking | Day roost of small numbers of bats | Exact emergence location not identified. Lots of social and foraging activity around tree. | 6 | Adjacent Proposed Scheme |

| Ecology survey code | Location | OS grid reference | Tree species | Species confirmed as utilising roost and (peak count) | Date of peak count and nature of survey | Roost type | Roost description | CFA | Approximate distance from the Proposed Scheme |
|---------------------|--------------------------------------|-------------------|--------------|--|---|---|---|-----|---|
| 010-BT1-024026 | Bridleway southwest of Gatemead Farm | TQ703 757 | Oak | 1 soprano pipistrelle on first visit; 1 common pipistrelle on second visit | 15.08.13 Back tracking | Day roost of single bat, probably male or non-breeding female | Near certain return to roost. Exact location not identified but last sighting of bat at stag-horn dead limbs at top of canopy | 6 | 90m east |
| 010-BT1-024027 | Bridleway southwest of Gatemead Farm | TQ702 757 | Oak | 1 x soprano pipistrelle | 14.08.13 Back tracking | Day roost of single bat, probably male or non-breeding female | Bat observed emerging from main trunk 4 m high amongst ivy | 6 | 80m east |

Roosting (buildings and structures)

2.4.98 In CFA 6, 35 buildings or other structures were subject to initial assessment. Of these:

- no confirmed roosts were recorded;
- one building containing features with a high potential to support roosting bats was recorded at a pharmaceutical research facility west of Breakspear Road South; and
- 15 buildings or other structures containing features with a moderate potential to support roosting bats were recorded, 13 of which were located within the pharmaceutical research facility; the other two were the River Pinn Bridge and a rail bridge on Breakspear Rd South.

2.4.99 Out of the 16 buildings identified as having high or moderate potential during the initial assessments, access for more detailed survey was only permitted for one structure, the River Pinn Bridge. This was subject to two emergence surveys. No bat roosts were identified during these surveys.

- 2.4.100 Detailed inspections (external or internal surveys) were carried out at five buildings which were not subject to initial assessment as they were not visible from PRoW (Shorthill Cottage immediately west of Copthall Covert and 3m north and south of the Proposed Scheme, Ruislip Rifle Club to the south of Ruislip Golf Course and within the Proposed Scheme, and three buildings at Ickenham Pumping Station on Breakspear Road South 60m north of the Proposed Scheme). Shorthill Cottage and Ruislip Rifle Club were assessed as having low potential as a result of an internal survey and these two buildings were scoped out of further assessment. The three buildings at Ickenham Pumping Station were assessed as having moderate potential and required further emergence surveys. Emergence and dawn surveys were carried out on these three buildings at Ickenham Pumping Station. No roosts were identified.

Bat activity surveys

- 2.4.101 Table 19 provides details of the bat activity transect and static surveys conducted in support of the scheme in this area.

Table 19: Bat activity surveys conducted within CFA 6

| Ecology survey code | Transect or static location | Number of surveys conducted | First survey date | Final survey date | CFA | Map Reference |
|---------------------|---|--|-----------------------|---------------------|-------|---------------|
| 010-BA1-020001 | Transect: Rail land between Mandeville Road and South Ruislip Station | 8 | 29th May 2013 | 8th August 2013 | 5 & 6 | EC-06-019 |
| 010-BA1-023002 | Transect: Rail land between West Ruislip Station and Harvil Road | 8 | 30th May 2013 | 9th August 2013 | 6 | EC-06-021 |
| 010-BA1-023001 | Transect: PRoW around Ruislip Golf Course | 9 | 24th April 2013 | 14th August 2013 | 6 | EC-06-021 |
| 010-BA1-024001 | Transect: PRoW around Newyears Green | 8 | 7th May 2013 | 14th August 2013 | 6 | EC-06-022 |
| 010-BA1-025001 | Transect: Copthall Farm | 10 | 29th April 2013 | 15th August 2013 | 6 | EC-06-022-L1 |
| 010-BA2-023001 | Static Location: Rail land at West Ruislip Station | 7 nights in June, July and August | 20th - 28th June 2013 | 8th - 15th Aug 2013 | 6 | EC-06-021 |
| 010-BA2-024003 | Static Location: River Pinn at Oak Farm | 7 nights in June and August and 2 nights in July | 20th - 28th June 2013 | 8th - 15th Aug 2013 | 6 | EC-06-021 |
| 010-BA2- | Static Location: | 7 nights in June | 20th - 28th | 8th - 15th Aug 2013 | 6 | EC-06-022 |

| Ecology survey code | Transect or static location | Number of surveys conducted | First survey date | Final survey date | CFA | Map Reference |
|--|---|---|---|---|-----|---------------|
| 024002 | Gatemead Farm | and August and 2 nights in July | June 2013 | | | |
| 010-BA2-024001 | Static Location: Rail land near Breakspear Road South | 7 nights in June, July and August | 20th - 28th June 2013 | 8th - 15th Aug 2013 | 6 | EC-06-022 |
| 010-BA2-024004, 010-BA2-024005 010-BA2-024006 | Static location: 3 x locations along bridleway southwest of Gatemead Farm | 2 separate nights in August (during back tracking surveys). | 8th-9th August 2013 (during back tracking surveys). | 14th-15th August 2013 (during back tracking surveys). | 6 | EC-06-022 |
| 010-BA2-025002 | Static Location: Copthall Farm | 7 nights in June and August and 2 nights in July | 20th - 28th June 2013 | 8th - 15th Aug 2013 | 6 | EC-06-022-L1 |
| 010-BA2-025003 010-BA2-025004 010-BA2-025005 | Three locations around Copthall Covert | 1 night with 3 x statics | 11-12th July 2013 (during back tracking surveys) | 11-12th July 2013 (during back tracking surveys) | 6 | EC-06-022-L1 |
| 010-BA2-025003 010-BA2-025004 010-BA2-025005 010-BA2-025006 | Four locations around Copthall Covert | 1 night with 4 x statics | 1st-2nd August 2013 (during backtracking surveys) | 1st-2nd August 2013 (during backtracking surveys) | 6 | EC-06-022-L1 |
| 010-BA2-025001 | Static Location: Rail land adjacent to Newyears Green Covert | 7 nights in June, July and August | 20th June 2013 - 28th June 2013 | 8th Aug 2013 - 15th Aug 2013 | 6 | EC-06-022 |

2.4.102 The following bat species have been recorded during the range of bat activity transect and static surveys conducted in support of the scheme in this area:

- common pipistrelle;
- soprano pipistrelle;
- nathusius' pipistrelle;

- noctule;
- Leisler's;
- serotine;
- brown long-eared bat;
- *Myotis* species; and
- *Nyctalus* / *Eptesicus* species.

2.4.103 Table 20 to Table 24 provide details of the data collected during the bat activity transect surveys conducted in support of the scheme in this area.

Appendix EC-003-001

Table 20: Bat activity transect survey results - Transect 010-BA1-020001

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|-------------------------------|---|---------------------------|--------------------------|---------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-020001 | Rail land between Mandeville Road and South Ruislip Station | | | | This transect is flanked by scrub and mature trees on both sides for its entire length. Initially (east), the transect is adjacent to the underground line but to the west it cuts through more open landscape towards the end when three main lines meet near South Ruislip Station. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ³³ | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ³⁴ | Rain (0-5) ³⁵ | Wind (0-12) ³⁶ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es |
| Visit 1: Dusk 29th May 2013 | 12 | 8 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 2: Dawn 30th May 2013 | N/R | 8 | 2 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 3: Dusk 4th June 2013 | 14 | 0 | 0 | 2-4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 4: Dawn 5th June 2013 | 10.9 | 7 | 0 | 3-6 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 5: Dusk 3rd July 2013 | 19 | 2-0 | 4 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Visit 6: Dawn 4th July 2013 | 12 | 2-8 | 0 | 1-2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 7: Dusk 7th August 2013 | 13 | 2 | 0 | 2 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

³³ Pp - common pipistrelle, Ppy - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

³⁴ Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

³⁵ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

³⁶ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|-------------------------------|---|---------------------------|--------------------------|---------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-020001 | Rail land between Mandeville Road and South Ruislip Station | | | | This transect is flanked by scrub and mature trees on both sides for its entire length. Initially (east), the transect is adjacent to the underground line but to the west it cuts through more open landscape towards the end when three main lines meet near South Ruislip Station. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ³³ | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ³⁴ | Rain (0-5) ³⁵ | Wind (0-12) ³⁶ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es |
| Visit 8: Dawn 8th August 2013 | 11 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.104 Regular, very low level, highly dispersed commuting and foraging activity from common pipistrelle bats was recorded on the Network Rail transect route between Mandeville Road and South Ruislip Station. A single commuting pass of noctule was also recorded on Visit 5.

Table 21: Bat activity transect survey results - Transect 010-BA1-023002

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|---------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 010-BA1-023002 | Rail land between West Ruislip Station and Harvil Road | | | | This stretch of railway is flanked by tall, mature trees on both sides for its entire length. The first half of the transect, at the West Ruislip Station end, the railway is on an embankment and for the second half of the transect, the Harvil Road end, it is in a cutting. The rail land for the last 500m of the transect at the Harvil Road end, is the Brackenbury Rail Cuttings SBI Grade 2 which comprises secondary woodland, scrub, semi-improved neutral grassland and tall herbs. The woodland in the last 200m of the transect connects with an area of plantation woodland that connects to the Newyears Green Covert to the north. | | | | | | | | | | | | | | | | |

| Visit number and date | Weather conditions | | | | Total species passes during transect survey ³⁷ | | | | | | | | | | | | | | | | |
|-------------------------------|--------------------|---------------------------|--------------------------|---------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| | Temp (°C) | Cloud (0-8) ³⁸ | Rain (0-5) ³⁹ | Wind (0-12) ⁴⁰ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | Nl | Es | Ny/Es |
| Visit 1: Dusk 30th May 2013 | 12-13 | 8 | 0 | 2-4 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Visit 2: Dawn 31st May 2013 | 12 | 8 | 0 | 2-4 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Visit 3: Dusk 5th June 2013 | 15 | 6 | 0 | 4 | 8 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Visit 4: Dusk 6th June 2013 | 10 | 8 | 0 | 3 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Visit 5: Dusk 4th July 2013 | 20 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 2 | 0 |
| Visit 6: Dawn 5th July 2013 | 12-9 | 4-6-2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Visit 7: Dusk 8th August 2013 | 18 | 1 | 0 | 2-4 | 10 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Visit 8: Dawn 9th August 2013 | 17 | 8 | 0-1-4 | 2-3 | 4 | 5 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

³⁷ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, Nl - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/Eptesicus bat.

³⁸ Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

³⁹ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

⁴⁰ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

- 2.4.105 Regular, low level, dispersed commuting and foraging activity from common and soprano pipistrelle bats was recorded on the Network Rail transect 4 route. The majority of bats were recorded at the western end of the transect, between the River Pinn and the Harvil Road, where the railway cuts between Newyears Green Covert to the north and Copthall Farm to the south. This area of the rail land includes Brackenbury Rail Cutting SBI Grade 2.
- 2.4.106 Very occasional, individual passes of other species were recorded, including noctule, serotine, brown long-eared bat and *Myotis* species bats, including some Natterer's bats.

Table 22: Bat activity transect survey results - Transect 010-BA1-023001

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|-------------------------------|---------------------------------|---------------------------|--------------------------|---------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-023001 | PRoW around Ruislip Golf Course | | | | The transect starts along mature tree-lined lanes with street lighting before passing onto open golf course with mature trees around the boundaries. After this are scrubby lanes with narrow footpaths before the transect joins the River Pinn in an open landscape with mature trees. South of the railway the transect passes into playing fields and avenues of mature trees adjacent to railway line and housing. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ⁴¹ | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ⁴² | Rain (0-5) ⁴³ | Wind (0-12) ⁴⁴ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es |
| Visit 1: Dusk 24th April 2013 | 15.1 | 8 | 6 (intermittent rain) | 1-2 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 2: Dawn 25th April 2013 | 12.1 | 8 | Occasional short | 2-3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

⁴¹ Pp - common pipistrelle, Ppy - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb - whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa - brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

⁴² Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

⁴³ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

⁴⁴ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | | |
|--------------------------------|---------------------------------|---------------------------|--------------------------|---------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|--|
| 010-BA1-023001 | PRoW around Ruislip Golf Course | | | | The transect starts along mature tree-lined lanes with street lighting before passing onto open golf course with mature trees around the boundaries. After this are scrubby lanes with narrow footpaths before the transect joins the River Pinn in an open landscape with mature trees. South of the railway the transect passes into playing fields and avenues of mature trees adjacent to railway line and housing. | | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ⁴¹ | | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ⁴² | Rain (0-5) ⁴³ | Wind (0-12) ⁴⁴ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es | |
| | | | showers | | | | | | | | | | | | | | | | | | | |
| Visit 3: Dawn 15th May 2013 | 6 | 8 | 0 | 9 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 4: Dusk 10th June 2013 | 16.5 | 8 | 0 | 0-1 | 8 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 5: Dawn 11th June 2013 | 9.9 | 7-8 | 0 | 0-1 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 6: Dusk 15th July 2013 | 21 | 1 | 0 | 0 | 12 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | |
| Visit 7: Dawn 16th July 2013 | 17 | 2 | 0 | 0 | 13 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | |
| Visit 8: Dusk 12th August 2013 | 17 | 8 | 0-3 | 0 | 10 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 9: Dawn 13th August 2013 | 12-8 | 0 | 0 | 0 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

- 2.4.107 Regular, low level, dispersed commuting and foraging activity from common and soprano pipistrelle bats was recorded on the Ruislip Golf Course transect route. The one exception to this is the observation of thirteen common pipistrelle bats commuting down Hills Lane away from the houses and towards the golf course 15-20 minutes after sunset during Visit₁, indicating a roost close-by.
- 2.4.108 Very occasional, individual passes of other species were recorded, including noctule and Leisler's bat.

Table 23: Bat activity transect survey results - Transect 010-BA1-024001

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|------------------------------|---------------------------------|---------------------------|--------------------------|---------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-024001 | PRoW around Newyears Green area | | | | This transect passes through scrubby woodland adjacent to housing before passing north onto lanes flanked by overhanging mature trees. Later the transect crosses farmland, primarily pastoral/cut for silage with flailed hedgerows and some mature trees. Towards the end of the transect there is standing water with unimproved meadow grassland. This transect includes the bridleway to the southwest of Gatemead Farm. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ⁴⁵ | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ⁴⁶ | Rain (0-5) ⁴⁷ | Wind (0-12) ⁴⁸ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es |
| Visit 1: Dusk 7th May 2013 | 17 | 2 | 0-2 | 2 | 6 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Visit 2: Dawn 8th May 2012 | 15 | 5 | 0 | 2 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Visit 3: Dusk 11th June 2013 | 16 | 2 | 0 | 2 | 24 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 4: Dawn 12th June 2013 | 15 | 6 | 1 | 2-3 | 22 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 10 | 0 | 1 | 0 |

⁴⁵ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa - brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

⁴⁶ Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

⁴⁷ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

⁴⁸ Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|--------------------------------|---------------------------------|---------------------------|--------------------------|---------------------------|---|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-024001 | PRoW around Newyears Green area | | | | This transect passes through scrubby woodland adjacent to housing before passing north onto lanes flanked by overhanging mature trees. Later the transect crosses farmland, primarily pastoral/cut for silage with flailed hedgerows and some mature trees. Towards the end of the transect there is standing water with unimproved meadow grassland. This transect includes the bridleway to the southwest of Gatemead Farm. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ⁴⁵ | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ⁴⁶ | Rain (0-5) ⁴⁷ | Wind (0-12) ⁴⁸ | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es |
| Visit 5: Dusk 16th July 2013 | 26 | 2 | 0 | 1 | 23 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Visit 6: Dawn 17th July 2013 | 20 | 2 | 0 | 1 | 16 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 |
| Visit 7: Dusk 13th August 2013 | 12-11 | 1 | 0 | 0 | 15 | 6 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Visit 8: Dawn 14th August 2013 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.109 Regular, low level dispersed commuting and foraging activity by common and soprano pipistrelle bats was recorded on the southern and eastern sections of the Newyears Green transect route. On Newyears Green Lane, and the bridleway south west of Gatemead Farm groups of both common and soprano pipistrelle bats were observed and recorded foraging around the mature trees. The highest numbers of bats recorded on any one occasion was five or more individuals on Visit 3. This lane and bridleway are also well-used by commuting bats of both species. Although there were many commuting passes that were heard but not seen (and so direction cannot be defined), those bats that were seen were heading in a south-easterly direction at dawn (on Visit 4 three common pipistrelles and one soprano pipistrelle exhibited this behaviour).

- 2.4.110 Very occasional, individual passes of other species were recorded, including noctule, Leisler's bat, serotine and *Myotis* species, including some Natterer's bats. The only activity possibly of note was two noctules observed commuting north-west from close to the junction of Newyears Green Lane and Brakespear Road close to sunrise on Visit 2. Noctules were recorded on other occasions but always dispersed, individual passes either commuting or foraging.

Table 24: Bat activity transect survey results - Transect 010-BA1-025001

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | | |
|--|--------------------|---------------------------|--------------------------|---------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|--|
| 010-BA1-025001 | Cophthall Farm | | | | This transect is adjacent to heavily flailed hedgerows with mature trees forming boundaries for fields of semi-improved grassland with low intensity cattle grazing. | | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ⁴⁹ | | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ⁵⁰ | Rain (0-5) ⁵¹ | Wind (0-12) ⁵² | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es | |
| Visit 1: Dusk 29th April 2013 | 10.2 | 1 | 0 | 0 | 11 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | |
| Visit 2: Dawn 30th April 2013 | 6.3 | 0 | 0 | 1-2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 3: Dusk 15th May 2013 | 11 | 4 | 0-4-0 | 1 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | |
| Visit 4: Dawn 16th May 2013 (Survey abandoned due to poor weather) | 2 | 1 | 1 (Mist) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Visit 5: Dusk 13th | 13.6 | 5 | 0 | 3 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

⁴⁹ Pp - common pipistrelle, Ppy - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, Nl - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

⁵⁰ Cloud cover on a scale of 0-8 where 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy.

⁵¹ Precipitation intensity on scale of 0-5 where 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.

⁵² Wind speed score of 0-12 against Beaufort scale where 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

| Ecology survey code | Transect location | | | | Description of habitats covered by transect | | | | | | | | | | | | | | | | |
|---------------------------------|--------------------|---------------------------|--------------------------|---------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA1-025001 | Cophall Farm | | | | This transect is adjacent to heavily flailed hedgerows with mature trees forming boundaries for fields of semi-improved grassland with low intensity cattle grazing. | | | | | | | | | | | | | | | | |
| Visit number and date | Weather conditions | | | | Total species passes during transect survey ⁴⁹ | | | | | | | | | | | | | | | | |
| | Temp (°C) | Cloud (0-8) ⁵⁰ | Rain (0-5) ⁵¹ | Wind (0-12) ⁵² | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Es |
| June 2013 | | | | | | | | | | | | | | | | | | | | | |
| Visit 6: Dawn 14th June 2013 | 8 | 0 | 0 | 1 | 5 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Visit 7: Dusk 17th July 2013 | 25 | 2 | 0 | 0 | 10 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Visit 8: Dawn 18th July 2013 | 18 | 2 | 0 | 0 | 11 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Visit 9: Dusk 14th August 2013 | 16-17 | 8 | 1 | 2 | 18 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Visit 10: Dawn 15th August 2013 | 18 | 8 | 1/0-3 | 1 | 6 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

- 2.4.111 Regular, low level, dispersed commuting and foraging activity by common and soprano pipistrelle bats was recorded on the Copthall Farm transect route. There were also occasional, individual foraging and commuting passes by noctules.
- 2.4.112 Table 25 to Table 33 provide details of the data collected during the bat activity static detector surveys conducted in support of the scheme in this area.

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Table 25: Summary of static detector monitoring results for 010-BA2-023001

| Ecology survey code | Static Location | | OS Grid | | | Description of habitat | | | | | | | | | | | | | |
|--|-----------------------------------|------------------------------------|--|-----|----|--------------------------------------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA2-023001 | Rail land at West Ruislip Station | | TQ 08272 86885 | | | Railway siding with scrub and stream | | | | | | | | | | | | | |
| Date (night monitoring commenced to night monitoring ceased) | | Number of nights detector deployed | Species peak night count during monthly monitoring ⁵³ | | | | | | | | | | | | | | | | |
| | | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Ep |
| 20th June 2013 - 28th June 2013 | | 7 | 22 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 1 |
| 25th July 2013 - 1st Aug 2013 | | 7 | 123 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 8th Aug 2013 - 15th Aug 2013 | | 7 | 7 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.113 Low levels of common pipistrelles were recorded at the static detectors deployed on rail land at West Ruislip Station during June and August. A peak night count of 123 bats was recorded in July but given the low levels recorded in June and August, this is likely to be the result of small numbers of bats passing the static detector many times whilst foraging. Low levels of activity from soprano pipistrelle, *Nathusius pipistrelle*, *pipistrellus* species, noctule, *Myotis* species and *Nyctalus / Eptesicus* bats were also recorded at this location.

Table 26: Summary of static detector monitoring results for 010-BA2-024003

| Ecology survey code | Static Location | OS Grid | Description of habitat |
|---------------------|------------------------|---------------|---|
| 010-BA2-024003 | River Pinn at Oak Farm | TQ 0748087245 | Semi-improved rough grassland and river habitat |

⁵³ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - *Nathusius'* pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, Nl - Leisler's bat, Es - serotine bat, Ny/Ep - *Nyctalus/ Eptesicus* bat.

| Date (night monitoring commenced to night monitoring ceased) | Number of nights detector deployed | Species peak night count during monthly monitoring | | | | | | | | | | | | | | | | |
|--|------------------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Ep |
| 20th June 2013 - 28th June 2013 | 7 | 74 | 23 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 16 | 1 | 0 | 1 |
| 16th July 2013 - 17th July 2013 | 2 | 55 | 78 | 1 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 32 | 0 | 0 | 10 |
| 8th August - 15th August 2013 | 7 | 120 | 60 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 2 | 0 | 0 | 0 |

- 2.4.114 Moderate to high levels of common and soprano pipistrelle bats were recorded by the static detectors deployed at Oak Farm alongside the River Pinn. Peak night counts of up to 32 noctule passes were also recorded. This is likely to be the result of low numbers of individual noctules foraging over the field at Oak Farm adjacent to the detector. Low numbers of pipistrellus sp, *Myotis* and *Nyctalus / Eptesicus* bats were also recorded. A single pass of a Leisler's was recorded in June and a single pass of a Nathusius pipistrelle was recorded in July.

Table 27: Summary of static detector monitoring results for location 010-BA2-024002

| Ecology survey code | Static Location | OS Grid | Description of habitat |
|---------------------|---|---------------|---|
| 010-BA2-024002 | Gatemead Farm on boundary with bridleway. | TQ07132 87397 | A strip of broad-leaved woodland along the southwest side of the Gatemead Farm fields bordering the bridleway. The fields are grazed by cattle. |

| Date (night monitoring commenced to night monitoring ceased) | Number of nights detector deployed | Species peak night count during monthly monitoring ⁵⁴ | | | | | | | | | | | | | | | | |
|--|------------------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Ep |
| 20th June 2013 - 28th June 2013 | 7 | 915 | 113 | 2 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 7 | 6 | 5 | 7 |

⁵⁴ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

| Ecology survey code | Static Location | OS Grid | Description of habitat | | | | | | | | | | | | | | | | |
|-------------------------------------|---|---------------|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 010-BA2-024002 | Gatemead Farm on boundary with bridleway. | TQ07132 87397 | A strip of broad-leaved woodland along the southwest side of the Gatemead Farm fields bordering the bridleway. The fields are grazed by cattle. | | | | | | | | | | | | | | | | |
| Date (night monitoring commenced to | | Number of | Species peak night count during monthly monitoring ⁵⁴ | | | | | | | | | | | | | | | | |
| 16th July 2013 - 17th July 2013 | | 2 | 82 | 42 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 8th August - 15th August 2013 | | 7 | 13 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.115 High numbers of common and soprano pipistrelle bats were recorded by the static detectors deployed on the south western boundary of Gatemead Farm. However, the average number of passes by these species in June was generally lower. For instance, other than on two nights, all nights recorded less than 100 common pipistrelle passes. It is therefore likely that small numbers of bats use this area as part of a foraging route, passing the static detectors on multiple occasions. The moderate to low numbers of common and soprano pipistrelles recorded in July and August would confirm this. Two passes of both *Nathusius'* pipistrelle and brown long-eared bat were recorded, both in June. Low numbers of noctules, Leisler's, serotine and *Nyctalus / Eptesicus* bats were also recorded at this location.

Table 28: Summary of static detector monitoring results during back tracking surveys on bridleway southwest of Gatemead Farm (010-BA2-024004, 010-BA2-024005 and 010-BA2-024006)

| Ecology survey code | Static Location | OS Grid | Description of habitat | | | | | | | | | | | | | | | | |
|--|---|------------------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA2-024004, 010-BA2-024005 and 010-BA2-024006 | Three locations along the bridleway during backtracking surveys | TQ 07145 87347 (central location) | Location 1 = Beginning of tree-lined bridleway (southern end) near Gatemead Farm Location 2 = Middle of tree-lined bridleway Location 3 = Northern end of tree-lined bridleway | | | | | | | | | | | | | | | | |
| Date (night monitoring commenced to night monitoring ceased) | | Number of nights detector deployed | Species peak night count during nightly monitoring ⁵⁵ | | | | | | | | | | | | | | | | |
| | | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | Nl | Es | Ny/Ep |

⁵⁵ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - *Nathusius'* pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb - whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa - brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, Nl - Leisler's bat, Es - serotine bat, Ny/Ep - *Nyctalus*/ *Eptesicus* bat.

| Ecology survey code | Static Location | | OS Grid | | | | Description of habitat | | | | | | | | | | | | |
|--|---|------------------|--|-----|---|---|--|---|---|---|---|---|---|---|---|---|---|---|---|
| 010-BA2-024004, 010-BA2-024005 and 010-BA2-024006 | Three locations along the bridleway during backtracking surveys | | TQ 07145 87347 (central location) | | | | Location 1 = Beginning of tree-lined bridleway (southern end) near Gatemead Farm Location 2 = Middle of tree-lined bridleway Location 3 = Northern end of tree-lined bridleway | | | | | | | | | | | | |
| Date (night monitoring commenced to night monitoring ceased) | | Number of nights | Species peak night count during nightly monitoring55 | | | | | | | | | | | | | | | | |
| 8-9th August 2013 (1 - 010-BA2-024004) | | 1 | 17 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 8-9th August 2013 (2 - 010-BA2-024005) | | 1 | 163 | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8-9th August 2013 (3 - 010-BA2-024006) | | 1 | 384 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 14-15th August 2013 (1 - 010-BA2-024004) | | 1 | 74 | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 14-15th August 2013 (2 - 010-BA2-024005) | | 1 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14-15th August 2013 (3 - 010-BA2-024006) | | 1 | 285 | 129 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 0 | 0 | 0 |

- 2.4.116 Moderate to low numbers of common and soprano pipistrelle bats were recorded at Locations 1 (beginning of tree-lined bridleway (southern end) near Gatemead Farm) and 2 (middle of tree-lined bridleway). In contrast, high numbers of bats were recorded at Location 3 (the northern end of the tree-lined bridleway) where a peak night count of 384 passes of common pipistrelles were recorded. Only a single night of recording was made on both surveys in August, but it is likely that the figures are a good representation of bat activity at these locations, given that they were surveyed one week apart. Again, the high numbers at Location 3 may be due to small numbers of bats passing the static detectors on multiple occasions as part of a foraging route. Low numbers of noctules were recorded at Locations 1 and 3 (southern and northern ends of the bridleway), although were absent at Location 2 (middle of bridleway), indicating that noctules are not using the full extent of the bridleway for commuting. Low numbers of *Myotis* bats were recorded at Locations 2 and 3, but not at Location 1 (southern end of the bridleway) indicating that bats are not using the full extent of the bridleway for commuting and only use the bridleway for occasional foraging or commuting through from east to west/west to east.

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Table 29: Summary of static detector monitoring results for location: 010-BA2-024001

| Ecology survey code | Static Location | | OS Grid | | | | Description of habitat | | | | | | | | | | | | |
|--|--------------------------------------|------------------------------------|--|-----|----|-------|--|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| 010-BA2-024001 | Rail land near Breakspear Road South | | TQ 06641 87325 | | | | Wooded railway embankment with little understory | | | | | | | | | | | | |
| Date (night monitoring commenced to night monitoring ceased) | | Number of nights detector deployed | Species peak night count during monthly monitoring ⁵⁶ | | | | | | | | | | | | | | | | |
| | | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Ep |
| 20th June 2013 - 28th June 2013 | | 7 | 633 | 1 | 9 | 84 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 1 | 3 |
| 25th July 2013 - 1st Aug 2013 | | 7 | 36 | 34 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 7 | 2 | 0 | 1 |
| 8th Aug 2013 - 15th Aug 2013 | | | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.117 High numbers of common pipistrelle passes were recorded in June at Location - 010-BA2-024001 (Rail land near Breakspear Road South). However, the actual number of passes by this species in June was generally much lower. For instance, other than on two nights, all nights recorded less than 100 common pipistrelle passes. It is therefore likely that small numbers of bats use this area as part of a foraging route, passing the static detectors on multiple occasions. The low numbers of common pipistrelles recorded in July and August would confirm this. A peak night count of nine Nathusius' pipistrelle bat passes were recorded in June. Other species recorded at low numbers at this location were pipistrellus sp., *Myotis* sp., noctule, serotine and *Nyctalus* / *Eptesicus* bats.

Table 30: Summary of static detector monitoring results for location: 010-BA2-025002

| Ecology survey code | Static Location | OS Grid | Description of habitat |
|---------------------|-----------------|----------------|--------------------------|
| 010-BA2-025002 | Copthall Farm | TQ 06814 86884 | Hedgerow / grazed fields |

⁵⁶ Pp - common pipistrelle, P py - soprano pipstrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

| Date (night monitoring commenced to night monitoring ceased) | Number of nights detector deployed | Species peak night count during monthly monitoring ⁵⁷ | | | | | | | | | | | | | | | | |
|--|------------------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Ep |
| 20th June 2013 - 28th June 2013 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16th July 2013 - 17th July 2013 | 2 | 42 | 41 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 7 | 0 | 0 | 1 |
| 8th August - 15th August 2013 | 7 | 16 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

2.4.118 Low numbers of common and soprano pipistrelle bats were recorded at 010-BA2-025002 (Cophall Farm), although numbers could be considered to be moderate (peak species count of 41 for both common and soprano pipistrelles) in July. Low numbers of *Myotis* sp., noctule and *Nyctalus* / *Eptesicus* bats were also recorded.

Table 31: Summary of static detector monitoring results at various locations around Cophall Covert

| Ecology survey code | Static Location | OS Grid | Description of habitat | | | | | | | | | | | | | | | | |
|--|--|--|---|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|--|
| 010-BA2-025003 010-BA2-025004 010-BA2-025005 | Three locations around Copthall Covert during backtracking surveys on a single night 11-12th July 2013 | TQ 06814 86884 | Location 1 = northern woodland edge. Location 2 = Dense understory within woodland at east end. Location 3 = woodland edge and hedgerow junction in south-east. | | | | | | | | | | | | | | | | |
| Location | | Species peak night count during monthly monitoring ⁵⁸ | | | | | | | | | | | | | | | | | |
| | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Ep | |
| 1 - 010-BA2-025003 | | 11 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 3 | 0 | 0 | 0 | |

⁵⁷ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

⁵⁸ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

| Ecology survey code | Static Location | OS Grid | Description of habitat | | | | | | | | | | | | | | | | |
|--|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| 010-BA2-025003 010-BA2-025004 010-BA2-025005 | Three locations around Copthall Covert during backtracking surveys on a single night 11-12th July 2013 | TQ 06814 86884 | Location 1 = northern woodland edge. Location 2 = Dense understory within woodland at east end. Location 3 = woodland edge and hedgerow junction in south-east. | | | | | | | | | | | | | | | | |
| Location | | Species peak night count during monthly monitoring ⁵⁸ | | | | | | | | | | | | | | | | | |
| 2 - 010-BA2-025004 | | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 3 -010-BA2-025005 | | 239 | 72 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 2 | 8 | 0 | 0 | |

2.4.119 The results of the static detector surveys in various locations around Copthall Covert in July indicate that bats are using the woodland edges (Locations 1- 010-BA2-025003 and 3- 010-BA2-025005) more than the internal areas of the woodland (Location 2 - 010-BA2-025004). The internal area of the woodland is dense with trees and scrub and as such, it is not surprising that bats are choosing to use the relatively unobstructed areas on the woodland edges.

2.4.120 There were high numbers of common pipistrelle bats recorded on the woodland edge at Location 3 (woodland edge and hedgerow junction in south-east), although this is likely to be bats staying in the area and foraging. Nathusius pipistrelle, noctule, Leisler's bat and *Myotis* sp bats were recorded on the woodland edges in small numbers.

Table 32: Summary of static detector monitoring results at various locations around Copthall Covert

| Ecology survey code | Static Location | OS Grid | Description of habitat |
|--|---|----------------|---|
| 010-BA2-025003 010-BA2-025004 010-BA2-025005 010-BA2-025006 | Four locations around Copthall Covert during backtracking surveys on a single night 1st-2nd August 2013 | TQ 06814 86884 | Location 1 = northern woodland edge. Location 2 = dense understory within woodland at east end. Location 3 = woodland edge and hedgerow junction in south-east. Location 4 = clearing in Copthall Covert |

| Location | Species peak night count during monthly monitoring ⁵⁹ | | | | | | | | | | | | | | | | |
|--------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Ep |
| 1 - 010-BA2-025003 | 214 | 121 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 19 | 11 | 0 | 0 |
| 2 - 010-BA2-025004 | 7 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 |
| 3 - 010-BA2-025005 | 234 | 169 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 13 | 2 | 0 | 0 |
| 4 - 010-BA2-025006 | 57 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 |

- 2.4.121 The results of the static detector surveys in various locations around Copthall Covert in August were similar to that recorded in July (summarised in Table 31) - the results indicate that bats are using the woodland edges (Locations 1- 010-BA2-025003 and 3- 010-BA2-025005) more than the internal areas of the woodland (Location 2 - 010-BA2-025004). The internal area of the woodland is dense with trees and scrub and as such, it is not surprising that bats are choosing to use the relatively unobstructed areas on the woodland edges.
- 2.4.122 There were high numbers of common and soprano pipistrelle bats recorded on the woodland edges, although this is likely to be bats staying in the area and foraging. Nathusius pipistrelle, noctule, Leisler's bat and *Myotis* sp bats were recorded on the woodland edges in small numbers.

Table 33: Summary of static detector monitoring results for location 010-BA2-025001

| Ecology survey code | Static Location | OS Grid | Description of habitat |
|---------------------|---|----------------|--|
| 010-BA2-025001 | Rail land adjacent to Newyears Green Covert | TQ 06259 87396 | Wooded railway embankment with little understory |

⁵⁹ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

Appendix EC-003-001

| Date (night monitoring commenced to night monitoring ceased) | Number of nights detector deployed | Species peak night count during monthly monitoring ⁶⁰ | | | | | | | | | | | | | | | | |
|--|------------------------------------|--|-----|----|-------|----|----|----|----|-----|--------|-------|----|----|----|----|----|-------|
| | | Pp | Ppy | Pn | P sp. | Mb | Md | Mn | Mm | Mbr | Mm /Mb | M sp. | Pa | Bb | Nn | NI | Es | Ny/Ep |
| 20th June 2013 - 28th June 2013 | 7 | 18 | 33 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 2 | 1 | 0 | 6 |
| 25th July 2013 - 1st Aug 2013 | 7 | 67 | 107 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 2 | 0 | 0 | 3 |
| 8th Aug 2013 - 15th Aug 2013 | 7 | 14 | 8 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

⁶⁰ Pp - common pipistrelle, P py - soprano pipistrelle, Pn - Nathusius' pipistrelle, P sp. - Pipistrelle bat species, Mb - Bechstein's bat, Md - Daubenton's bat, Mn - Natterer's bat, Mm - whiskered bat, Mbr - Brandt's bat, Mm/Mb -whiskered/ Brandt's bat, M sp - *Myotis* bat species, Pa -brown long-eared bat, Bb - barbastelle bat, Nn - noctule bat, NI - Leisler's bat, Es - serotine bat, Ny/Ep - Nyctalus/ Eptesicus bat.

- 2.4.123 Moderate to low numbers of common and soprano pipistrelle bats were recorded at the static location on rail land adjacent to Newyears Green Covert 010-BA2-025001. Low numbers of *Myotis* species, noctule and *Nyctalus* / *Eptesicus* bats were recorded and a single pass of a brown long-eared bat was recorded in July. Numbers appear to be lower than those recorded at the static location along the railway corridor to the east (010-BA2-024001 - Rail land near Breakspear Road South) but this probably only indicates that bats are not using location 010-BA2-025001 for foraging as much. 010-BA2-024001 which has areas of rough grassland and scrub adjacent to the railway may therefore be preferred by foraging bats than the woodland edge habitat adjacent to location 010-BA2-025001.

Backtracking surveys - Copthall Covert and Bridleway south-west of Gatemead Farm

- 2.4.124 Backtracking surveys were undertaken due to the limitations of carrying out detailed climbing inspections and individual emergence and dawn surveys of trees in Copthall Covert and on the bridleway southwest of Gatemead Farm.
- 2.4.125 The backtracking surveys at Copthall Covert undertaken during July and August 2013 recorded common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, Leisler's bat, *Myotis* species bats, brown long-eared bat and serotine. A tree roost was identified in the south-east corner of the wood, as included in the tree roost table above. This roost appeared to support a single bat of a *Pipistrellus* species. With the exception of this roost no other roosts were confirmed by backtracking surveys.
- 2.4.126 During each of the two back tracking surveys, low numbers (maximum 3) of bats were observed commuting from the Covert, south, along the hedgerows towards Copthall Farm within the hour before dawn. These were three common pipistrelles on the first occasion and two sopranos and one common pipistrelle on the second occasion. This suggests there may be a day roost/s for a small number of pipistrelles in these buildings. Also of note during the July 2013 survey at Copthall Covert was an accumulation of foraging common and soprano pipistrelles on the track in the south-west corner of the wood - including 8 or more individuals.
- 2.4.127 The backtracking surveys at the bridleway southwest of Gatemead Farm (carried out on two nights in August 2013) found that the bridleway was used extensively by both common and soprano pipistrelles for foraging and commuting. In particular, they were seen to commute from the south and east where they joined the bridleway and commuted north at dusk. Other species recorded in smaller numbers included noctule, *Myotis* species, brown long-eared and occasional Leisler's. Three of the high potential trees present in the bridleway had small numbers (up to two or three bats but usually solitary individuals) of roosting pipistrelles (one common pipistrelle roost, one soprano pipistrelle roost and one roost used by a common pipistrelle and a soprano pipistrelle bat on different occasions). The pattern of use was not regular and two other trees were noted as possible transitory roost sites for individual common and soprano pipistrelle bats.

Discussion

- 2.4.128 With regard to roosting bats, several bat tree roosts were identified during the field surveys carried out in CFA6 including at Oak Farm, Copthall Farm, Copthall Covert, and the bridleway southwest of Gatemead Farm. All those identified appeared to support just one or two individuals of common species roosting in trees. These are likely to be non-maternity i.e. male or non-breeding female bats in transitional roosts. The backtracking surveys at Copthall Covert recorded common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, *Myotis* species and brown long-eared, but only a single *Pipistrellus* roost in a tree was confirmed. The backtracking surveys at the bridleway southwest of Gatemead Farm recorded three non-maternity tree roosts of common or soprano pipistrelles. It was noted that other suitable trees in the bridleway may also be used occasionally as roosts.
- 2.4.129 The field surveys carried out in CFA6 did not identify any confirmed roosts in buildings or other structures however one high potential building was identified at the pharmaceutical research facility west of Breakspear Road South and several moderate potential buildings and structures were identified including the Breakspear Road South rail bridge, the River Pinn rail bridge and a number of buildings at the pharmaceutical research facility. Except for the River Pinn rail bridge, these high or moderate buildings and the one other rail bridge were not subject to further survey due to access restrictions or safety concerns and therefore the presence of roosts cannot be ruled out. Roosts may also be present in the small number of buildings on private property within the land required for the Proposed Scheme which were not included in the field surveys.
- 2.4.130 No records of bat roosts in trees or buildings were provided by GiGL or the London Bat Group. However, additional information on roosts was made available from a bat worker familiar with the area⁶¹. It is likely that some of the bats recorded on the transects carried out in CFA6 originated from some of the roosts listed below.
- A maternity colony of around 15 brown long-eared bats in a private property on Harvil Road 30m east of the land required (2007), and subject to an EPS licence for development since then.
 - Roosts of brown long-eared and *Pipistrellus* bats in a private property north of Bayhurst Wood, 280m north of the land required for the construction of the Proposed Scheme in CFA7. These roosts have been subject to an EPS licence for development recently, year not known.
 - Two maternity roosts of noctules, with around 60-70 bats each (2009), in Bayhurst Wood approximately 500m northwest of the land required for the construction of the Proposed Scheme.
 - Two maternity roosts of Daubenton's bat, with around 109 and 40 bats (2009), in Bayhurst Wood approximately 500m northwest of the land required for the construction of the Proposed Scheme. These bats are known to travel to the Colne Valley to forage.

⁶¹ Dave Cove, RSK Senior Ecologist

- A colony of 5-10 brown long-eared bats in South Harefield (2012) 650m northwest of the land required for the construction of the Proposed Scheme in Harefield, located in CFA7.
- A maternity colony of around 300 soprano pipistrelle bats near Ladygate Lane in north-west Ruislip (2007), approximately 700m east of the land required for the construction of the Proposed Scheme.
- Two maternity roosts of noctules with around 84 and 64 bats (2009), approximately 800m north of the land required for the construction of the Proposed Scheme in Mad Bess Wood.
- Two maternity roosts of Natterer's bat with around 62 and 30 bats (2009) approximately 800m north of the land required for the construction of the Proposed Scheme in Mad Bess Wood.
- A hibernation roost of Daubenton's bat, Natterer's bat and brown long-eared bat near Ruislip Lido over a km northeast of the land required for the construction of the Proposed Scheme. Year not known.
- London's largest soprano pipistrelle roost, at 1800 bats, on Park Avenue in Ruislip over a km east of the land required for the construction of the Proposed Scheme. Year not known.
- Four trees used by a maternity colony of 87 noctules in 2013, peak count 108 in 2012) located over 2.5kilometres south of the land required for the construction of the Proposed Scheme.

2.4.131 With regard to foraging and commuting bats, the transect surveys in CFA6 recorded regular, low level, dispersed commuting and foraging activity from common and soprano pipistrelle bats with occasional passes also recorded from a variety of other species, including Nathusius' pipistrelle, noctule, Leisler's, serotine, brown long-eared and *Myotis* species, including Natterer's. However, there are some places where more significant activity was recorded during either the activity, emergence or backtracking surveys. These were noted where multiple individual bats (greater than five) were observed by surveyors, all exhibiting the same behaviour in the same place, either commuting or foraging. These included Hills Lane, north of Ruislip Golf Course and away from the Proposed Scheme, where concentrations of common pipistrelles (13 individuals) were observed commuting; the River Pinn bridge, where concentrations of a mixture of the two pipistrelle species (15 individuals) were observed commuting north along the River (indicating the possible presence of a roost in the housing estate to the south); Newyears Green Lane and the bridleway southwest of Gatemead Farm, where concentrations of both commuting (4+ individuals) and foraging pipistrelles (5+ individuals) were observed; and a track on the south-west corner of Copthall Covert, where concentrations of pipistrelles (8+) were observed foraging. In addition, six noctule commuting passes were recorded during a dawn survey at Ickenham pumping station away from the proposed scheme. Although these bats were not seen it seems likely that they were commuting northwards to one of the four known noctule roosts to the north.

- 2.4.132 No extra species were recorded by the static detectors over and above those already recorded on the transect surveys. However, very high numbers of passes were recorded in some locations, including up to 915 passes of common pipistrelle recorded in June by the static detector placed on the bridleway southwest of Gatemead Farm.
- 2.4.133 It was not possible to carry out surveys within Newyears Green Covert, which is a semi-natural broadleaved woodland within the land required for the construction of the Proposed Scheme. This woodland is connected to Brackenbury Railway Cutting SBI Grade 2 via an area of plantation woodland and was included in the rail land activity transect between West Ruislip Station and Harvil Road. Newyears Green Covert comprises suitable habitat for roosting, foraging and commuting bats and is likely to support an assemblage of bats similar to that recorded during all the field surveys in CFA6 since it lies in the middle of and is connected to the areas surveyed.
- 2.4.134 Neither was it possible to survey the area to the south of Bayhurst Wood, which comprises arable fields with a series of connecting hedgerows which include mature trees and link to Bayhurst Wood to the north, part of London's largest ancient woodland. This area also has suitable habitat for roosting, commuting and foraging bats and is likely to support the same assemblage of species as that found using the areas that were covered by field surveys in the remainder of CFA6 to the south.
- 2.4.135 It is possible that Newyears Green Covert and the fields south of Bayhurst Wood provide roosting habitat for the rarer bat species that were recorded at low levels foraging or commuting during the field surveys of neighbouring sites including Natterer's, Leisler's, noctule, Nathusius' pipistrelle and serotine. However due to the low numbers observed it is unlikely that maternity colonies are present.
- 2.4.136 GiGL or the London Bat Group did not provide any records of bat species that had not already been recorded during the field surveys for this CFA.

3 Otter

3.1 Introduction

- 3.1.1 This section of the appendix presents details of baseline information relating to otter for the section of the Proposed Scheme that will pass through Community Forum Areas (CFA) 1 to 6 inclusive.

3.2 Methodology

- 3.2.1 Details of the standard methodology utilised for otter surveys are provided in the Scope and Methodology Report Addendum (Volume 5: Appendix CT-001-000/2).
- 3.2.2 Existing otter data was obtained from Greenspace Information for Greater London (GiGL)⁶².
- 3.2.3 The watercourses subject to survey, and the level of access within the required survey extent, are presented in Table 34.

Table 34: Summary of watercourses subject to otter survey

| Ecology survey code | Watercourse or water body name | Feature type | OS grid reference (start and finish) | Level of access within required survey extent ⁶³ | Survey dates | CFA | Approximate Distance from the Proposed Scheme (m) and orientation |
|---------------------|-------------------------------------|--------------|--|---|---|-----|---|
| 010-OT1-001001 | Grand Union Canal at Camden | Canal | 5km spot checks from Public Rights of Way (PRoW) TQ 348 835 to TQ248 819 | Moderate (50%) (one bank only) | Only 1 spot check visit and habitat assessment, not suitable and scoped out from further visits 14- 15 March 2013 | 2 | Adjacent |
| 010-OT1-008001 | Grand Union Canal at Old Oak Common | Canal | 5km spot checks from PRoW TQ272 827 to TQ191 835 300m 'full survey' TQ233 823 to TQ208 to 830 | Moderate (50%) (one bank only) | 2 spot check visits and habitat assessment 14- 15 March 2013 , 19 June 2013 Detailed survey: 15 March 2013, 19 June 2013 | 4 | Adjacent |

⁶² Greenspace Information for Greater London. Available from: <http://www.gigl.org.uk/>. Last accessed: August 2013.

⁶³ 'Required survey extent' is the survey extent for detailed surveys. Access to spot check locations is detailed in the limitations below.

| Ecology survey code | Watercourse or water body name | Feature type | OS grid reference (start and finish) | Level of access within required survey extent ⁶³ | Survey dates | CFA | Approximate Distance from the Proposed Scheme (m) and orientation |
|---------------------|--------------------------------|--------------|---|--|---|-----|---|
| 010-OT1-017001 | Grand Union Canal at Greenford | Canal | 5km spot checks from PRoW TQ 182 836 to TQ117 805 | Moderate (50%) (one bank only) (excluding section between Horsenden and Hayes) | 2 otter spot checks (partial extent only) and habitat assessment - 11-15 March 2013 and 09 May 2013 Detailed survey - 09 May 2013, 19 June 2013 | 5 | Adjacent |
| 010-OT1-013001 | River Brent | River | 5km spot checks from PRoW TQ203 860 to TQ145 817 300m 'habitat assessment' TQ 174 827 to TQ 180 830 | Little (more than 25%) (access to only one stretch) | 1 spot check visits and habitat assessment and detailed surveys.. 30 January 2013, and 12 February 2013 and 14 February 2013 (Subsequent Proposed Scheme design change meant further visits were not undertaken) | 5 | Adjacent |
| 010-OT1-021001 | Yeading Brook (East and West) | Stream/ditch | Yeading Brook East – 5km spot checks from PRoW TQ 203 860 to TQ145 817. 300m 'habitat assessment' TQ174 827 to TQ180 830. Yeading Brook West – 5km spot checks from PRoW TQ 134 887 to TQ098 837. 300m 'habitat assessment' TQ105 860 to TQ099 856 | Moderate (25-75%) (limited to PRoW) | 1 spot check visits and habitat assessment and detailed survey. 11-13 March 2013 (Subsequent Proposed Scheme design change meant further visits were not undertaken) | 6 | Adjacent |

| Ecology survey code | Watercourse or water body name | Feature type | OS grid reference (start and finish) | Level of access within required survey extent ⁶³ | Survey dates | CFA | Approximate Distance from the Proposed Scheme (m) and orientation |
|---------------------|--------------------------------|--------------|--|--|--|-----|---|
| 010-OT1-023001 | Ickenham Stream | Ditch/stream | TQ080 870 to TQ096 843 300m 'full survey' TQ07994 86976 to TQ0803086736 300m 'full survey' TQ508010 186908 to TQ507988, 186966 | Majority (75% - 99%) (viewed from PRow) | Habitat assessment 13 - 14 March 2013 Detailed survey: 14 March 2013 and 10 May 2013 | 6 | Within |
| 010-OT1-024001 | River Pinn | River | 5km spot checks from PRow TQ 114 889 to TQ0610 826 300m 'full survey' TQ075 872 to TQ072 869 | Majority (75% - 99%) (viewed from PRow) | 2 spot check visits and habitat assessment s 13-14 March 2013, June 2013 Detailed survey: 17 June 2013, 18 June 2013; 19 June 2013; | 6 | Adjacent |
| 010-OT1-025001 | Newyears Green Bourne | Small stream | 300m 'full survey' TQ06367 88066 to TQ06061 87754 | Little (more than 25%) (Access was permitted to one bank north-east of Harvil Road, no access to either side south-west of Harvil Road) | 1 detailed survey: 20 June 2013 | 6 | Within |

3.3 Deviations, constraints and limitations

- 3.3.1 Due to access restrictions and design changes, the four recommended survey visits were not completed for any of the survey sites, as detailed in Table 34.
- 3.3.2 Survey from PRow affected the ability to complete spot checks at some of the bridges. Bridges were accessible, but as the survey was undertaken from the top of the bridge, it was not possible to view underneath where potential spraint sites may have been located. Further details of the limitations at site and/or spot check locations are detailed below.
- At the Grand Union Canal at Old Oak Common access by towpath was to the southern bank only. The majority of the northern canal bank was visible from

the tow path on the south bank, allowing assessment of bank profile and surrounding habitat, except alongside Kensal Green Cemetery (TQ 23216 82343), where the bankside vegetation hangs over the concrete lip of the canal. It is considered that the ability to detect presence/absence was unaffected.

- At the Grand Union Canal at Greenford (CFA5) access by towpath was to the southern bank only. This would reduce potential for signs to be recorded, especially as areas of PRoW may be less likely to have signs present due to disturbance. No spot checks were undertaken from GUC bridges between Horsenden Hill Recreational Ground (TQ1540 8420) and the Broadway near Hambrough Tavern (TQ11789 80593). The ability to detect presence/absence on the north side of the canal at Greenford was affected by these limitations.

- 3.3.3 At the following specific locations, the ability to detect presence / absence was prevented due to lack of access as they were not visible from PRoW; at the Yeading Brook (CFA5) surveys were restricted from TQ105 860 to TQ099 856 and TQ174 827 to TQ180 830 amounting to five out of 45 spot check locations; at the River Pinn (CFA6) surveys were restricted from TQ075 872 to TQ072 869, amounting to 16 out of the sixty-four spot check locations; at Ickenham Stream (CFA6) surveys were restricted from TQ07994 86976 to TQ 08030 86736 and TQ08010 86908 to TQ07988, 86966 which are sections of the stretch to the south of the existing railway line; and at Newyears Green Bourne (CFA6) surveys were restricted from TQ056 887 to TQ060 877 which is the section south of Harvil Road. Where field surveys were not undertaken, desk study information, aerial photography and the knowledge of the characteristic of adjacent stretches of watercourse were used, to form a view on the the likely presence / absence of otter.
- 3.3.4 All surveys were undertaken during suitable weather conditions, and the weather preceding the survey would not have removed signs of otter, eg no periods of high water flow which may have removed spraints.

3.4 Baseline

Watercourses scoped out of further survey

- 3.4.1 At the Grand Union Canal at Camden (CFA1 and 2) and Grand Union Canal at Old Oak Common (CFA4) no signs of otter were found and habitat assessment found the canal to be largely unsuitable for otter. These stretches of the canal were subsequently scoped out, and no further surveys were required.

Summary

CFA1-4

- 3.4.2 Watercourses in CFA1, 2 and 4 have been scoped out from further survey (Grand Union Canal at Camden and Grand Union Canal at Old Oak Common).
- 3.4.3 There are no watercourses in CFA3.

CFA5

- 3.4.4 If present, otters are considered likely to be scarce and only commuting through this area, based on the available information. While field surveys did not record any signs of otter, due to the limited access and restricted numbers of visits, it is assumed they may be present occasionally along these watercourses. Field surveys and desk study indicate habitats along the River Brent and Grand Union Canal at Greenford are suitable only in small stretches (eg, reedbed south of Carr Road and at Sudbury Golf course), as they pass through a mosaic of highly urban area comprising areas of roads, industrial, commercial and residential sites which are disturbed by dog walkers and members of the public.

CFA6

- 3.4.5 The desk study returned records for otter along the Yeading Brook, but no signs were recorded during field surveys. While field surveys did not record any signs of otter, due to the limited access and restricted numbers of visits, it is assumed they may occasionally be present along these watercourses. Yeading Brook runs through a largely suburban landscape and immediate surrounding habitat includes residential and industrial areas, woodland and recreational open space and is largely of medium – low suitability for otter. It is therefore considered that, if present, otters are likely to only be commuting through this area.
- 3.4.6 The desk study did not return any records for otter along the Ickenham Stream and Newyears Green Bourne. Field surveys at the Ickenham Stream and Newyears Green Bourne did not record signs of otter. This may have been due to the limited access and restricted numbers of visits, and hence it has been assumed that they may be present on occasions, moving along these watercourses. Ickenham Stream runs through a largely suburban landscape, and immediate surrounding habitat includes a golf course, residential areas and recreational open space. Newyears Green Bourne was found to have a very low water level and was dry in places. It is likely to have a highly variable water level and provide a negligible food supply for otter, although bankside vegetation could provide some cover for otter. If present, otters may use this small stream for commuting as it connects to the Savay Lake and the complex of water bodies of the Colne Valley
- 3.4.7 Background data search results found no records for otter along the River Pinn corridor, and field surveys did not record signs. This may have been due to the limited access and restricted numbers of visits, and hence it has been assumed that they may be present on occasions along these watercourses. While the river runs through a largely suburban landscape, otters could potentially use suitable areas of habitat (eg where there are areas of dense cover) for a holt or a couch. Whilst the possibility of a holt or a couch cannot be excluded, otters are more likely to be commuting along the river, to areas of more suitable habitat.

4 Water vole

4.1 Introduction

4.1.1 This section of the appendix presents details of baseline information relating to water vole for the section of the Proposed Scheme that will pass through Community Forum Area (CFA) 1 to 6 inclusive.

4.2 Methodology

4.2.1 Details of the standard methodology utilised for water vole are provided in the Scope and Methodology Report Addendum (Volume 5: Appendix CT-001-000/2).

4.2.2 Existing water vole data was obtained from Greenspace Information for Greater London (GiGL)⁶⁴.

4.2.3 The watercourses subject to detailed water vole surveys, and the level of access within the required survey extent are presented in Table 35.

Table 35: Summary of water vole survey conducted in CFA4 to 6 inclusive

| Ecology survey code | Water course or water body name | Feature type | OS grid reference | Level of access within required survey extent | Survey dates | CFA | Approximate Distance from Proposed Scheme (m) and orientation |
|---------------------|---------------------------------|--------------|-------------------|--|-----------------------------------|-----|---|
| 010-WV2-021001 | Yeading Brook (Western Arm) | Stream | TQ101857 | Little (more than 25%) - (survey undertaken where accessible from PRoW) | 11 March 2013 | 6 | Adjacent |
| 010-WV2-023001 | Ickenham Stream | Stream | TQ079869 | Full (100%) (but survey only undertaken from PRoW, as no access permissions) | 09-10 May 2013 10-14 June 2013 | 6 | Within |
| 010-WV2-024001 | River Pinn | River | TQ073871 | Full (100%) | 09-10 May 2013 10-14 June 2013 | 6 | Adjacent |
| 010-WV2-025001 | Newyears Green Bourne | Stream | TQ060878 | Little (more than 25%) (as survey only undertaken from PRoW, as limited access permissions.) | 20 June 2013 | 6 | Within |

⁶⁴ Greenspace Information for Greater London. Available from: <http://www.gigl.org.uk/>. Last accessed: August 2013.

4.3 Deviations, constraints and limitations

- 4.3.1 The principal constraint was the limitation of access, as detailed in Table 35 which resulted in deviation. With the exception of the Grand Union Canal at Greenford (CFA5) and the River Pinn (CFA6) such access restrictions had a negligible impact as watercourses were small, and easily surveyed from a single side. Where sites were surveyed in the early season (i.e. mid-April to June) it is likely that the ability to detect presence / absence was unaffected.
- 4.3.2 Access restrictions at the Grand Union Canal at Greenford (CFA5) meant that while a habitat assessment was possible from adjacent Public Rights of Way (PRoW), no detailed survey could be undertaken, and there was no access permission to the north-western canal bank or the reedbeds to the north of the canal. As a consequence a precautionary assumption that water vole are present has been made based on habitat suitability and desk study data.
- 4.3.3 Due to poor survey conditions in spring 2013 associated with prolonged wet and cold weather, the first surveys in CFA6 began in mid-May 2013 rather than mid-April 2013. Where second surveys were undertaken in 2013, they were outside the July-September period, either due to access constraints, or because surveys were curtailed by cut off dates. Second visits were therefore, undertaken in mid June 2013, one month after the first survey. This deviation required at least two months between survey visits. As such, the visits were not spread sufficiently, and it is possible that signs may not have been recorded, and water vole presence may have been under-recorded.

4.4 Baseline

Watercourses scoped out of further survey

- 4.4.1 The watercourses in CFA1, 2 and 4 (the Grand Union Canal at Camden and at Old Oak Common) were scoped out after initial habitat suitability assessments on the basis of poor habitat suitability. The sides of the canal are mostly constructed of concrete or steel sheeting and therefore unsuitable for burrowing. There is little habitat in the surrounds to support this species.
- 4.4.2 Field surveys recorded suitable habitat for water vole along the stretch of the River Brent (CFA5) which was subject to survey. However signs of mink (footprints) were also recorded on the river banks. Mink is a predator of water vole and has caused declines and sometimes localised extinctions of water vole populations⁶⁵. It is therefore considered likely that water voles are absent from this area of the River Brent.
- 4.4.3 In CFA6 the moat at Brackenbury Farm was scoped out as it was beyond the area where significant effects to water vole could occur.

⁶⁵ Barretto and MacDonald (2000), *The decline and local extinction of a population of water voles Arvicola terrestris in southern England*, Zeitschrift für Säugetierkund.

Summary

- 4.4.4 Watercourses in CFA1, 2 and 4 have been scoped out from further survey (Grand Union Canal at Camden and Grand Union Canal at Old Oak Common) and there are no watercourses in CFA3.
- 4.4.5 Desk study data indicate water vole are present in land adjacent to the Grand Union Canal Greenford (CFA5), with a single record of water vole (2005) in the ditch system approximately 50m from the Proposed Scheme. A small area of suitable habitat (common reed with some tree cover) was present at the Greenford Grand Union Canal, which is linked to the ditch system. On a precautionary basis, given the suitable habitat and desk study record, it has been assumed that water vole are present along the Grand Union Canal Greenford.
- 4.4.6 In CFA6 field surveys found no evidence of water vole at Yeading Brook (Western Arm), Ickenham Stream, the River Pinn or Newyears Green Bourne. Signs of mink were recorded along the River Pinn and along the Yeading Brook, and hence it is considered unlikely that water voles are present. No evidence of water vole was recorded during the survey visit to the Ickenham Stream or Newyears Green Bourne. Whilst the survey limitations mean it is possible that water vole presence may have been under-recorded, and absence cannot be confirmed, it is unlikely that water voles occur due to the presence of mink and the limited suitability of the habitat along both of these watercourses. Where Ickenham Stream passes through a golf course it is dry in places and the adjacent habitat heavily managed. South of the existing railway line it is very shallow and runs through a modified channel, or through over-shaded earth banks with limited vegetation. Newyears Green Bourne holds little water, is over-shaded by adjacent scrub and hedgerow, and there is little suitable foraging habitat on the banks of adjacent grass meadows.

5 Dormouse

5.1 Introduction

5.1.1 This section of the appendix presents a summary of the baseline data relating to dormouse for the section of the Proposed Scheme that will pass through CFA1 to 6 inclusive.

5.2 Methodology

5.2.1 Details of the standard methodology utilised for dormouse are provided in Technical Note HS2 Ecological Surveys: Field Survey Methods and Standards which is included as an appendix to Volume 1.

5.2.2 Habitat assessments were undertaken in any potentially suitable habitat, where access permitted. Detailed surveys were undertaken in the following locations:

- Perivale Wood in CFA5 was only subject to a nest search on 29 October 2012 as no further surveys were undertaken due to design changes and as subsequent surveys were curtailed by the survey cut off dates; and
- four sites (Copthall Farm, Copthall Covert, Network Rail Land between Ickenham Road and the River Pinn and Network Rail Land between Breakspear Road South and Harvil Road), all in CFA6, were subject to nest tube surveys.

5.2.3 The table below provides the number of tubes, duration of deployment and number of points obtained for each nest tube survey undertaken.

Table 36: Methodological details for dormouse nest tube surveys conducted within CFA1 to 6 inclusive

| Ecology survey code | Location | Centroid grid reference | Number of tubes deployed | Survey start - survey end date | Sum of indices of probability ⁶⁶ | Map series and sheet number reference |
|---------------------|---|-------------------------|--------------------------|-----------------------------------|---|---------------------------------------|
| 010-HD2-025001 | Copthall Farm | TQ 06667 86785 | 175 | 16 May 2013 - 06 September 2013 | 73.5 | EC-12-022 |
| 010-HD2-025003 | Copthall Covert | TQ 06570 87140 | 90 | 8th July 2013 - 06 September 2013 | 25.2 | EC-12-022 |
| 010-HD2-024001 | Network Rail Land between Ickenham Road and the River Pinn | TQ 073 872 | 40 | 17 May 2013 - 08 August 2013 | 11.2 | EC-12-021 |
| 010-HD2-025002 | Network Rail Land between Breakspear Road South and Harvil Road | TQ 065 873 | 50 | 17 May 2013 - 08 August 2013 | 14 | EC-12-021 |

⁶⁶ Sum of the index of probability scores obtained for the months tubes were deployed, adjusted based on the number of tubes deployed in comparison with the standard of 50 tubes.

5.3 Deviations, constraints and limitations

- 5.3.1 Access to Adelaide Local Nature Reserve (LNR) (CFA3) was not granted and as such it has not been possible to undertake a habitat assessment for dormice at this site. Due to the urban and isolated nature of this site however, and lack of desk study records of dormice in the area, dormice are not likely to be present.
- 5.3.2 The hedgerows in fields south of Bayhurst Wood (north of St Leonard's Farm) were assessed during a scoping survey undertaken from PRow as being suitable for dormouse. These hedgerows connect to Ruislip Woods SSSI / Ruislip Wood and Poors Field Site of Metropolitan Importance (SMI), an ancient woodland site comprising mainly hornbeam coppice with oak standards. Due to the late inclusion of these hedgerows in the land required for the Proposed Scheme (July 2013), no dormouse surveys were possible. The citations for the SSSI and SMI contain no mention of dormice and no records were returned from GiGL.
- 5.3.3 The sites listed below were subject to habitat assessments during initial visits or from PRow and were also considered to contain suitable habitat. However, access restrictions prevented any further detailed survey or in some cases any equipment being deployed.
- Wormwood Scrubs (CFA4);
 - Gatemead Farm (CFA6);
 - Bridleway southwest of Gatemead Farm (CFA6);and
 - Newyears Green Covert (CFA6).
- 5.3.4 At Copthall Farm, some of the nest tubes were destroyed by hedge cutting and by cattle. However, sufficient nest tubes remained to determine presence / absence.
- 5.3.5 The surveys carried out within the two rail areas in CFA6 did not achieve the recommended minimum search effort score of 20 as surveys were curtailed early due to project timescales, and so the findings for these areas are based on the effort undertaken and other ecological factors.

5.4 Baseline

- 5.4.1 There are a small number of sites that were subject to an initial habitat assessment but were not suitable and were subsequently scoped out of a full survey. These were Guinness Mounds (CFA5), St Mary's RC Cemetery (CFA5) and Dunster Cottage in CFA6. The habitats in these areas are isolated from other areas of suitable dormouse habitat and are too small to support self-sustaining populations.
- 5.4.2 No evidence of dormouse was recorded during any of the field surveys.
- ### CFA1-2
- 5.4.3 No records of dormouse were returned from GiGL in CFA1 and 2. There is no suitable habitat within CFA1 and 2, further surveys were not carried out and dormice are considered to be absent.

CFA₃

- 5.4.4 No records of dormouse were returned from GiGL and no dormouse surveys were carried out in CFA₃. Whilst the woodland at Adelaide Road LNR may be suitable for dormouse, due to the urban and isolated nature of this site, dormice are not likely to be present.

CFA₄

- 5.4.5 No records of dormouse were returned from GiGL in CFA₄ and only habitat assessment was undertaken due to access restrictions. The habitat assessment recorded suitable dormouse habitat at Wormwood Scrubs and is connected to other suitable dormouse habitat along the railway corridor. As a result, the presence of dormouse cannot be fully discounted from this site. However, given the lack of records in the area, and the negative survey results in suitable habitat in CFA₅ (which would form the likely colonisation source of any population in Wormwood Scrubs) and the urban location, it is unlikely that dormouse are present in Wormwood Scrubs.

CFA₅

- 5.4.6 No records of dormouse were returned from GiGL in CFA₅. A record of dormouse⁶⁷ from a number of years ago could not be verified.
- 5.4.7 The habitat assessment identified suitable habitat in Perivale Wood. It is largely isolated from other potentially suitable habitat, except for scrub along the existing railway.
- 5.4.8 No evidence of dormouse was recorded during the nut search survey at Perivale Wood. As the record of a dormouse cannot be verified, and the nut search results indicate that this species is absent from the wood, it is likely that dormice are not present in Perivale Wood. However, due to a design change, no nest-tube surveys were carried out, which would have confirmed presence / absence.
- 5.4.9 There are no other suitable habitats for dormice in CFA₅.

CFA₆

- 5.4.10 No records of dormouse were returned from GiGL in CFA₆.
- 5.4.11 The survey findings from Network Rail Land between Ickenham Road and Harvil Road did not record any dormouse or field signs indicating their presence. Despite the low search effort score achieved in these areas, the presence of dormouse in these areas is considered unlikely given the absence recorded during the initial visits, the relatively isolated setting of this area of woodland and scrub and lack of desk study records.
- 5.4.12 The survey findings at Copthall Farm and Copthall Covert indicate that dormice are absent from these areas.
- 5.4.13 Further areas of potentially suitable habitat for dormice could not be surveyed due to access restrictions, such as Newyears Green Covert and hedgerows in fields south of Bayhurst Wood (including those north of St Leonard's Farm). Given these woodlands

⁶⁷ Information provided by the Selbourne Society in October 2012.

and hedgerows are more extensive and may contain high quality habitat for dormice, a precautionary approach has be taken and the presence of dormice cannot be ruled out.

6 References

Barretto and MacDonald, (2000), *The decline and local extinction of a population of water voles Arvicola terrestirs in southern England*, Zeitschrift fur Saugetierkund.

Greenspace Information for Greater London. Available from: <http://www.gigl.org.uk/>.
Last accessed: August 2013.